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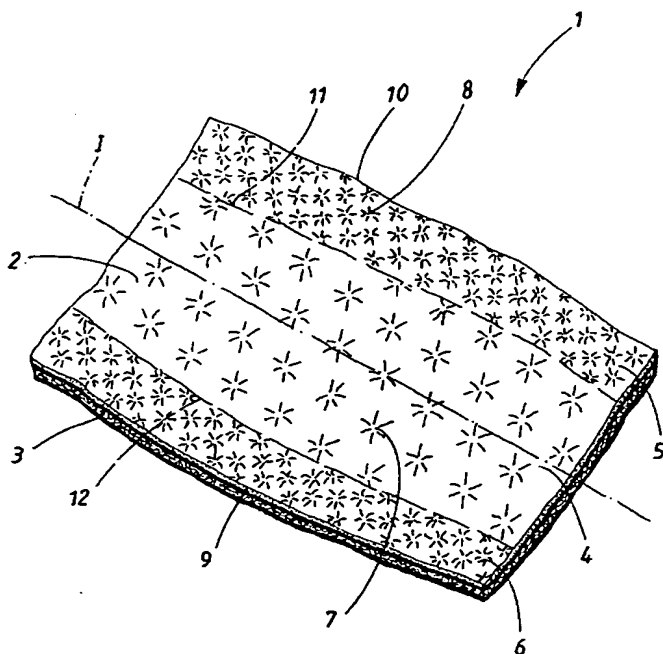
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(54) Title: A MATERIAL LAMINATE FOR USE AS A COVERING SHEET IN AN ABSORBENT ARTICLE



(57) Abstract: The invention relates to a material laminate for use as a covering sheet on absorbent articles such as sanitary napkins, incontinence protectors, diapers, pant diapers, or the like. The material laminate comprises a first, fluid pervious fibrous material layer and a second fluid pervious porous material layer, wherein at least one of the two material layers comprises thermoplastic material and wherein the two material layers are mutually connected by means of the covering material laminate exhibiting bond sites within which the thermoplastic material has been caused to at least partially soften or melt and thereby bond the two material layers together. In the planar extension, the material laminate exhibits two side portions extending in the length direction and having an extension in the width direction from a respective longitudinal side edge and a distance in towards the longitudinal central axis of the material laminate and a central portion positioned between the side portions in the planar extension of the material laminate, wherein the first material layer and the second material layer in the central portion of the material laminate are intermittently bonded together with a first bond pattern and that the first material layer and the second material layer in the two side portions of the material laminate are

intermittently bonded together with a second bond pattern wherein the percentage bonded area in relation to the total area in the two side portions is greater than the percentage bonded area in relation to the total area in the central portion. The invention further pertains to an absorbent article comprising the material laminate.

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A MATERIAL LAMINATE FOR USE AS A COVERING SHEET IN AN
ABSORBENT ARTICLE.

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TECHNICAL FIELD:

The present invention relates to a material laminate for use as a covering
sheet for absorbent articles such as sanitary napkins, incontinence
10 protectors, diapers, pant diapers, or the like. The material laminate
comprises a first, fluid pervious fibrous material layer and a second fluid
pervious porous material layer, wherein at least one of the two material
layers comprises thermoplastic material and wherein the two material layers
are mutually connected by means of the covering material laminate
15 exhibiting bond sites within which the thermoplastic material has been
caused to at least partially soften or melt and thereby bond the two material
layers together. The invention also pertains to an absorbent article
comprising the material laminate.

20 BACKGROUND OF THE INVENTION:

For fluid permeable covering sheets for absorbent articles of this kind, which
in use are intended to be in contact with the body of a user, high demands
are put on both softness and dryness.

25

However, it has proven difficult to accomplish a fluid permeable covering
sheet having a soft, textile-like surface which remains dry even after
repeated wetting when the covering sheet is being used on an absorbent
article.

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It is known to use nonwoven materials in order to achieve a soft and smooth surface on an absorbent article. In order to obtain a dry surface closest to the skin of a user, it is also known to use hydrophobic nonwoven materials which have been perforated so as to create apertures in the material which are larger than the interstices between the fibres in the nonwoven material. Thereby, the fluid is passed through the perforated apertures, through the covering material and down to an underlying absorbent material layer.

In order to bond the covering sheet to an inside layer, it is common to use adhesive. However, the adhesives which are available at the present time are usually relatively hydrophobic, implying that fluid transfer from the covering sheet to the inside layer is hindered. When using a more hydrophilic adhesive, there is a risk that the adhesive will migrate into the hydrophobic nonwoven layer closest to the user which will cause the surface closest to the user to be perceived as wet after a first fluid insult. Another problem in connection with adhesively bonded material laminates wherein one of the layers are perforated is that the adhesive in the perforations may irritate the skin of the user during use. It is also a problem in the manufacture of the laminate that there is a risk that adhesive which happens to be applied in the perforations may be transferred to the transport band of the machine. A further problem in connection with absorbent articles exhibiting a perforated covering sheet which is adhered to an inner layer, is the risk of adhesive penetration when the articles are folded after manufacturing.

It is further known, for instance from EP 0,685,214 and EP 0,617,602 to bind together the covering sheet with an inside layer by melting the layers together in a bond pattern. In EP 0,617,602, a covering sheet consisting of a film is thermally bonded to an inside material layer by melting the layers together within specific bond areas. The bonds may, for instance, be circular bond sites.

However, it has been discovered that the covering sheet and the inside layer loose volume and thereby softness and skin friendliness by thermal bonding. Furthermore, the thermal bonds make the surface of the covering sheet more stiff and thereby less comfortable to carry in direct contact with skin. Since
5 the bonds reduce the volume, i.e. the thickness, of the covering sheet and the inside layer, the distance between the absorption body of the article and the body of the user is also reduced. This means that the risk of fluid penetrating back out of the article and wetting the body of the user is increased. It has also been discovered that the thermal bonds affect the fluid
10 uptake in the covering sheet closest to the user so that the surface closest to the user's body is perceived as being wet after a first fluid insult.

Another problem when using absorbent articles of the above-mentioned kind is that they are exposed to different kinds of mechanical stress. Accordingly,
15 in order to minimise the risk that the constituting layers are separated from each other during use, it is important that the layers in the absorbent article are sufficiently strongly attached to each other.

Furthermore, the bonding should be such that the fluid transfer ability
20 between the constituting layers is good, that the article exhibits low rewet and high softness and conformability.

DESCRIPTION OF THE INVENTION:

25 The problem with accomplishing an absorbent article which can withstand mechanical stress and at the same time exhibit a fluid pervious covering sheet which is soft and comfortable against skin and still exhibits high surface dryness has been substantially removed by the present invention.

30 A material laminate in accordance with the invention, for use as a fluid pervious covering sheet on absorbent articles such as, for instance, a

sanitary napkin, an incontinence protector or a diaper is primarily distinguished in that the material laminate, in its planar extension, exhibits two side portions extending in the length direction and each extending a distance in the transverse direction from a side edge towards the longitudinal central axis of the material laminate and a central portion positioned between the side portions in the planar extension of the material laminate. The first material layer and the second material layer in the central portion of the material laminate are intermittently bonded together in a first bond pattern and the first material layer and the second material layer in the two side portions of the material laminate are intermittently bonded together in a second bond pattern. Further, the percentage bonded area in relation to the total area in the two side portions is greater than the percentage bonded area in relation to the total area of the central portion.

The invention further concerns an absorbent article exhibiting a substantially elongated shape with a planar extension, a length direction, a width direction and a thickness direction and exhibiting a central axis extending in the length direction and two opposing side edges extending in the length direction. The absorbent article comprises a fluid pervious covering sheet, a fluid impervious covering sheet and an absorption body enclosed between the two covering sheets. The absorbent article comprises a material laminate in accordance with the previous description, wherein the material laminate, in a central portion extending in the length direction, exhibits the first bond pattern and the material laminate in the longitudinally extending side portions of the absorbent article exhibits the second bond pattern. In addition, the percentage bonded area in relation to the total area in the two side portions is greater than the percentage bonded area in relation to the total area in the central portion. The central portion extends in the length direction of the article over the whole of the length of the article and the two side portions extend in the length direction of the article over the whole of the length of the article.

With a covering sheet in accordance with the invention, it has shown to be considerably less risk of the two constituting layers separating from each other. Since the risk of the layers separating from each other is reduced, this also brings about a reduction of the risk of leakage. Another advantage with the invention is that the user's visual impression of the article is improved when the material layers are kept together along the longitudinal side edges of the article. The advantage with the surface closest to the user in the longitudinal central portion of the article not exhibiting as great a proportion of bonded area as the longitudinal side portions is that the covering sheet becomes softer and more comfortable to wear in contact with skin. A further advantage is that the risk of the central portion taking up liquid at the bond sites is considerably reduced.

15 In order to obtain the previously mentioned advantages with a covering sheet comprising a material laminate in accordance with the invention, the material laminate in accordance with a preferred embodiment exhibits a proportion of bonded area in relation to the total area in the central portion which is at least 0.5% less than the proportion of bonded area in relation to
20 the total area in the side portions.

In accordance with one embodiment, the proportion of bonded area in the side portions is at least 3% but preferably more than 5%.

25 In accordance with another embodiment, the proportion of bonded area in relation to the total area in the central portion is between 3% and 6% and the proportion of bonded area in relation to the total area in the side portions is between 5% and 8%. This embodiment has been shown to be advantageous since the material layers both in the side portions and in the central portions
30 should be sufficiently strongly attached to each other in order to keep air from intruding between the layers and lower the fluid transfer ability, but at

the same time the proportion of bonded area must not be so great so that the covering sheet will take up fluid at the bond sites to such an extent so as to make the surface feel wet after a first wetting. Particularly in the central portion, the proportion of bonded area is dependent on the thickness and the density of the material layers constituting the material laminate. For thin and dense material layers, the proportion of bonded area is preferably greater than for material layers, which are somewhat bulkier and thicker.

In accordance with one embodiment, both the first material layer and the second material layer are relatively thin. Preferably, the first material layer exhibits a basis weight of 27 g/m² or less and the second material layer exhibits a basis weight of 35 g/m² or less. The advantage with such an embodiment is that the materials closest to the bond sites only exhibit a densified structure to a very limited extent in comparison with the structure of the material layer outside of the area closest to the bond sites. This means that the tendency of the bond sites attracting fluid by capillary action is comparatively restricted.

In accordance with one embodiment, each bond site exhibits a smallest direction of extension and a second direction of extension which is perpendicular to the smallest direction of extension wherein the smallest direction of extension is less than 0.8 millimetres, at least in the first bond pattern. In accordance with a still more preferred embodiment, the smallest direction of extension is 0.3 millimetres or less, at least in the first bond pattern. The said embodiments are advantageous since it has been shown that when the bond sites exceed a certain size, the risk is greater that fluid will be taken up in the material laminate, in and around the bond sites. In order to achieve sufficient anchoring between the layers, i.e. avoid that air exists between the layers and diminishes the contact between them, it has further proven more advantageous to have a greater number of small bond sites than a smaller number of bond sites with a larger bond area.

The material laminate is preferably in the form of a coherent, continuous web wherein the central portion and the side portions extend continuously in the length direction of the continuous web. Such a material laminate is comparatively easy and rational to produce in a continuous process and may, further, be used as a covering sheet on an absorbent article without any particular synchronisation problems.

In accordance with a preferred embodiment, the first bond pattern extends over the full length of the article and also the second bond pattern over all of the length of the two side portions of the article. In such an embodiment, the proportion of bonded area in the central portion is the same over the full length of the article, i.e. the surface of the central portion of the covering sheet which in the plane of the article is situated closest to the transversely extending end edges of the article does also exhibit a smaller proportion of bonded area than the proportion of bonded area in the longitudinally extending side portions. The advantage with such an embodiment is that the manufacture of an absorbent article with such a covering sheet is simpler due to less synchronisation problems. Synchronisation in relation to the absorption body does only have to be made in the length direction of the absorption body. A further advantage is that, when bonding together the material laminate for use as a covering sheet for absorbent articles, the same patterned roller can be used for different sizes of the absorbent article.

In accordance with one embodiment, the side portions are 4 millimetres wide or more along all of the length of the article. Furthermore, the central portion exhibits the same width in the width direction over all of the length of the central portion. Since the crotch portion of the article is somewhat smaller in the width direction than the two end portions of the article, this implies that the side portions are narrowest in the crotch portion and are somewhat wider in the end portions of the article.

In accordance with one embodiment, the bond sites comprise spot bonds.

5 In accordance with another embodiment, the second bond pattern is more dense than the first bond pattern. This implies that the distance between the bond sites in the second bond pattern is smaller than the distance between the bond sites in the first bond pattern.

10 In accordance with one embodiment, both the first material layer and the second material layer are relatively thin. Preferably, the first material layer exhibits a basis weight of 27 g/m² or less and the second material layer exhibits a basis weight of 35 g/m² or less. The advantage with such an embodiment is that the materials closest by the bond sites only to a very limited extent exhibit a densified structure when compared to the structure of
15 the material layer outside of the area closest to the bond sites. This means that the tendency of the bond sites attracting fluid by capillary action is comparatively restricted.

SHORT DESCRIPTION OF FIGURES:

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Fig. 1 shows a planar view of a material laminate in accordance with the invention, with a first bond pattern.

Fig. 2 shows a second bond pattern.

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Fig. 3 shows a sanitary napkin with a material laminate in accordance with the invention.

30

Fig. 4 shows an incontinence protector with a material laminate in accordance with the invention.

DETAILED DESCRIPTION OF EMBODIMENTS:

The material laminate 1, which is shown in Fig. 1, comprises a first fluid pervious fibrous material layer 2 and a second fluid pervious porous material layer 3. At least the first material layer 2 but preferably both material layers 2,3 comprises thermoplastic material. Suitable thermoplastic materials are polyolefins such as polyethylene and polypropylene and polyamides, polyesters or the like. Further, different kinds of bicomponent fibres can be used. The two material layers 2,3 are mutually connected by bond sites in the material laminate 1 where the two material layers 2,3 have been compressed and the thermoplastic material has been at least partially softened and/or melted.

The material laminate 1 exhibits a planar extension, a length direction, a width direction and a thickness direction. The material laminate 1 exhibits a central axis extending in the length direction and two opposing longitudinal side edges 9,10 extending in the length direction. In the thickness direction, the material laminate comprises a first fluid pervious fibrous material layer 2 and a second fluid pervious porous material layer. A central portion 4 extends from the longitudinal central axis of the material laminate and a distance out towards each longitudinal side edge. Two longitudinal centre lines 11,12 delimit the central portion 4. A side portion 5,6 extends from each centre line 11,12 of the central portion 4, towards each of the longitudinal side edges 8,9 of the material laminate, respectively. The material layers 2,3 in the central portion 4 of the material laminate are intermittently bonded together in a first bond pattern 7 and the material layers 2,3 in the side portions 5,6 of the material laminate are intermittently bonded together in a second bond pattern 8. The percentage bonded area in relation to the total area in the two side portions 5,6 is greater than the percentage bonded area in relation to the total area of the central portion 4.

When the material laminate is used as a fluid pervious covering sheet on an absorbent article, the first material layer 2 is the layer on an absorbent article which is intended to be facing a user. For this reason, it is important that the first layer 2 has a smooth and soft surface. The first material layer 2
5 suitably consists of a nonwoven material. Nonwoven materials may be produced by any one of a number of methods, for instance by carding or spinning of a fibrous web which is then bonded. Further, what is known as the meltblown method may be used to depose short fibres in the form of a fibrous web. Several different ways of binding the fibres in a nonwoven
10 material exist. For instance, different kinds of bonding agents may be used. Furthermore, heat meltable components in the material may be used with ultrasonic bonding or with heating. Other bonding methods are needling and hydroentangling. In addition, different bonding methods may be combined with each other.

15 The second material layer 3 may also consist of a nonwoven material. When the material laminate is intended to be used as a fluid pervious covering sheet for a sanitary napkin, the second material layer 3 is suitably a nonwoven material with a higher degree of hydrophilicity than the first
20 material layer 2. In such an article, the second material layer 3 will suitably act as a fluid dispersion layer, at the same time diminishing rewet from the absorption body under pressure.

When the material laminate is intended to be used as a fluid pervious
25 covering sheet for an incontinence protector or a child's diaper, the second material layer 3 preferably has a greater thickness than the first material layer and is constituted of a porous and resilient fibre material. The second material layer 3 acts as a fluid transfer layer and should have the ability to acquire large amounts of fluid in a short time, spread the fluid in the plane of
30 the material layer, transfer the fluid to an absorption body positioned beneath the material laminate and, in addition, be able to store fluid which

has not yet been absorbed by the absorption body. Particularly suitable materials for use in the second material layer are synthetic fibre wadding, carded, bonded or unbonded fibrous layers or relatively bulky nonwoven materials. Other types of suitable materials are porous hydrophilic foam materials. It is also conceivable that the second material layer consists of two or more layers of different or the same type of material.

The two material layers 2,3 are mutually bonded with a large number of bond sites 7,8. The bond sites have been formed by simultaneous compression and application of energy to the material laminate 1. Upon energy application, the thermoplastic material softens or melts at the bond sites 7,8 and thereby the two material layers 2,3 are bonded together. The bonding of the first and the second material layer 2,3 is carried out by heat bonding such as, for instance ultrasonic bonding or laser bonding. When cooling the molten or softened thermoplastic material in the laminate 1, the molten and/or softened material solidifies.

The material laminate 200 which is shown in Fig. 2 exhibits spot-shaped bond patterns. The material laminate 200 exhibits a first bond pattern 207 in the longitudinal central portion 204 of the article and a second bond pattern 208 in the longitudinal side portions 205,206 of the article. In the central portion 204 the spot-shaped bonds 204 in the bond pattern 207 are at a greater distance from each other than the spot-shaped bonds in the second bond pattern 208 in the two side portions 205,206. Naturally, the bond sites could have other shapes than those which have been shown in Figs. 1 and 2. When the bond sites consist of line-shaped bond areas, this means that the smallest extension of the bond site is considerably smaller than the second extension which is perpendicular to the smallest extension. The term line-shaped bond sites does also comprise curved bond sites. Further, the first bond pattern and the second bond pattern may have the same shape or alternatively exhibit different shapes. When the bond patterns have the

same shape, the bond sites in the first bond pattern are more sparsely distributed or alternatively each pattern unity in the first bond pattern is more sparsely distributed. It is also possible that each bond site in the first bond pattern occupies a smaller surface than each bond site in the second bond pattern. It is also possible, in the width direction of the material laminate, to have bond patterns exhibiting a greatest proportion of bonded area in relation to the proportion of non-bonded area closest to the longitudinal side edges of the material laminate, wherein the proportion of bonded area gradually diminishes in a direction toward the longitudinal central axis of the material laminate.

The sanitary napkin 300, shown in Fig 3 comprises a first fluid permeable covering sheet 301, in accordance with the invention, a fluid impermeable covering sheet 313, and an absorption body 315 enclosed between the covering sheets. The fluid impermeable covering sheet 313 may consist of a fluid impermeable plastic film, a nonwoven sheet which has been coated with a fluid barrier material, or some other flexible sheet of material which resists fluid penetration. It is generally advantageous if the fluid impermeable covering sheet has a certain degree of breathability, i.e. will permit the passage of water vapour. The two covering sheets 301,313 have a somewhat larger extension in the plane than the absorption body 315 and extend a distance past the edges of the absorption body 315, around the entirety of its periphery. The covering sheets 301,313 are joined to each other within the protruding portions, for instance by gluing, or by welding with heat or ultrasonically. It is also possible to perform the bonding of the protruding portions simultaneously with the bonding together of the first and second material layers 302,303 of the fluid pervious covering sheet.

The absorption core 315 is usually constructed of one or more layers of cellulose fibres, for instance fluffed cellulose pulp. An example of an absorbent structure which is suitable for the purpose is found in WO

94/10956, which publication describes an absorbent material which is cut from a web of material without preceding defibration and mat-forming steps. The material increases the surface dryness of the resulting article, which is a particular advantage when the fluid permeable covering sheet 301 has a
5 textile sheet of material closest to the user.

In addition to cellulose fibres, the absorption core 315 may also contain superabsorbent material, i.e. material in the form of fibres, particles, granules, film or the like, which has the ability to absorb fluid corresponding
10 to several times the weight of the superabsorbent material itself. The superabsorbent material binds the absorbed fluid and forms a fluid-containing gel. Further, the absorbent core 315 may contain binders, shape stabilising components, or the like. Additional absorption layers which improve the absorption properties may also be used, such as different types
15 of wicking inserts, or material layers. The absorbent core 315 may be chemically or physically treated to alter the absorption properties. It is, for instance, common to arrange compressed areas in an absorption layer in order to control the fluid flow in the absorbent core. Moreover, other types of absorption materials may be utilised, alone or in combination with cellulose
20 fibres and superabsorbent material. Some examples of useful absorbent materials are absorbent nonwoven materials, foam, or similar.

On the outside of the fluid impermeable covering sheet 313 is arranged a fastening means 317 in the form of two areas of self-adhesive glue. Before
25 use, the adhesive areas 317 are preferably covered by removable protection sheets of release-coated paper, or plastic film, which are not shown in the drawing. A number of adhesive patterns other than the ones which are shown are, of course, conceivable, as well as other kinds of fastening means such as hook-and-loop surfaces, press-studs, girdles, special underpants, or
30 the like. A sanitary napkin of the kind shown in Fig. 3 is attached inside an ordinary pair of underpants during use. The fastening means should

naturally be of a kind which permits removal of the sanitary napkin from the underpants without causing damage thereto.

The sanitary napkin 300 exhibits somewhat wider end portions 318, 319 and a somewhat narrower crotch portion 320 located between the end portions 318, 319. The crotch portion 320 is the portion of the sanitary napkin which is intended to be placed in the user's crotch during use and serve as a receiving surface for the body fluid which is discharged to the sanitary napkin.

Furthermore, the sanitary napkin exhibits two transversely extending end edges 322,324, and two longitudinally extending side edges 326,328, running between the end edges 322,324.

The sanitary napkin is further provided with fastening flaps 330,332, which are formed of the two covering sheets 301,313 and which extend from the side edges 326,328 of the sanitary napkin 300 at the crotch portion 320. The fastening flaps 330,332 are intended to be folded around the leg edges of the user's underpants during use of the sanitary napkin 300 and to be attached to the outside of the underpants. For this purpose, the fastening flaps 330,332 are provided with special fastening means 334, which may be chosen in the same way as the fastening means 317 on the fluid impermeable covering sheet 313. Naturally, the invention can also be applied to sanitary napkins which do not exhibit any protruding fastening flaps in the crotch portion, but an advantage with such an embodiment is that the second bond pattern extends in the width direction of the article along the whole length of the fastening flaps, whereby the width of the second bond pattern will not be less than in the article's two end portions.

The fluid permeable covering sheet 301 consists of a first layer of material 302 and a second layer of material 303. The first layer of material 302 consists of a textile material, which is intended to be in contact with the body

of the user when the sanitary napkin is being used. The textile material may consist of a woven or knitted cloth but is preferably a spunbond-type nonwoven material. Further, the first layer of material 302 exhibits a plurality of penetrating apertures 336. Obviously, it is also possible that the first material layer 302 exhibit apertures of different sizes. An advantage with the first material layer exhibiting penetrating apertures 336 is that the material layer can be constituted by a hydrophobic nonwoven material which is not inherently fluid permeable. Such a first material layer will remain comparatively dry even after several wettings.

The apertures may, for instance be made by means of heated needles. A heat meltable material in the first material layer 302 can, in connection with the formation of the apertures 336 in the material layer, melt in the area closest to each aperture 336. When the melted material re-solidifies after the perforation process, it forms a substantially fluid impervious edge around the entire periphery of the aperture. The continuous edge increases the tensile strength of the covering sheet and prohibits fluid from wicking from the apertures out into the cover sheet 301. Instead, body fluids that strike the sanitary napkin 300 will pass down through the covering sheet 301 to the absorption body 315 which is positioned inside the covering sheet.

The second layer of material 303 of the fluid permeable covering sheet 301 is arranged inside the first layer of material 302. The second layer of material 303 preferably consists of a material which is more hydrophilic than the first layer of material 302, whereby fluid transport between the two material layers 302,303 will take place in a direction towards the absorption body 315 of the sanitary napkin. Some examples of suitable materials are different types of nonwoven materials, air-laid or wet-laid cellulose layers, wadding of different kinds, foam materials, or the like.

The two material layers 302,303 in the covering sheet 301 are bonded together in the same manner as the material layers 2,3 in the material laminate 1 which is described in Fig. 1. Accordingly, the covering sheet 301 exhibits a first bond pattern 307 in the longitudinal central portion 304 of the article and a second bond pattern 308 in the longitudinal side portions 305,306 of the article. The first bond pattern 307 consists of line-shaped bond sites wherein five or, alternatively, six bond sites together form a star-shaped unity. Accordingly, the first bond pattern 307 consists of a plurality of star-shaped unities. The second bond pattern 308 consists of a plurality of straight line-shaped bond sites extending in the width direction of the article. When the bond sites consist of an essentially straight line, it is an advantage if the extension of the bond sites in the length direction exhibits an angle to the length direction of the article. Hence, in this manner the material layers at the side edges of the article are more efficiently prohibited from separating from each other as compared to if the extension of the bond sites in the length dimension coincides with the length direction of the article.

The incontinence protector 400 which is shown in Fig. 4 comprises a covering sheet 401 which is constituted by a material laminate as previously described in Fig. 1. The incontinence protector 400 has substantially the same construction as the sanitary napkin in Fig. 3. The second material layer 403 of the fluid pervious covering sheet 401 is a fluid pervious fluid transfer layer. The fluid pervious covering sheet 401 encloses together with a fluid impervious covering sheet 413 an absorption body 415. The two covering sheets 401,413 have a somewhat greater planar extension than the absorption body 415 and extend a distance out beyond the edges of the absorption body. The covering sheets 401,413 are mutually connected within the protruding portions, for instance by adhesion or ultrasonic or heat welding.

As a non-limiting example of a material laminate in accordance with the invention can be mentioned a nonwoven material composed in accordance with the invention and consisting of a first material layer 402 of a nonwoven material of synthetic fibres and a second material layer 403 of a synthetic fibrous wadding.

The absorption body 415 is constructed similarly to the absorption body 315 described for the sanitary napkin in Fig. 3. Absorption bodies for incontinence protectors usually contain more superabsorbent material than absorbent bodies for sanitary napkins. The thin absorption bodies which are usual in children's diapers and incontinence protectors of today, often consist of a compressed blended or layered structure of cellulose fluff pulp and superabsorbent material.

In the same manner as for the sanitary napkin which is described in Fig. 3, a fastening device is arranged on the outside of the fluid barrier covering sheet 413, for instance in the form of two areas of self-adhesive glue. Before use, the adhesive areas 417 are suitably covered by removable protection sheets of release-coated paper, or plastic film, which are not shown in the drawing. A number of adhesive patterns other than the ones which have been shown are, of course, conceivable.

The incontinence protector 400 exhibits somewhat wider end portions 418,419 and a somewhat narrower crotch portion 420 situated between the end portions 418,419. The crotch portion 420 is the part of the incontinence protector which, during use, is intended to be placed in the crotch of the user and serve as receiving surface for the body fluid which is excreted to the incontinence protector.

CLAIMS:

- 5 1. A material laminate for use as a covering sheet for absorbent articles such as a sanitary napkin, an incontinence protector, a diaper, or the like with a planar extension, a length direction, a width direction and a thickness direction and exhibiting a central axis extending in the length direction and two opposing side edges (9,10) extending in the length direction and
10 comprising, in the thickness direction, a first fluid pervious fibrous material layer (2) and a second fluid pervious porous material layer wherein at least one of the material layers comprises thermoplastic material and wherein the two material layers are mutually connected by means of the covering material laminate exhibiting bond sites within which the thermoplastic
15 material has been caused to at least partially soften or melt and thereby bond the two material layers together **characterized in that** the material laminate (1), in the planar extension, further exhibits two side portions (5,6) extending in the length direction and each extending a distance in the transverse direction from a respective side edge (9,10)
20 towards the longitudinal central axis of the material laminate (1) and a central portion (4) positioned between the side portions (5,6) in the planar extension of the material laminate (1) wherein the first material layer (2) and the second material layer (3) in the central portion (4) of the material laminate are intermittently bonded together in a first bond pattern (7) and the
25 first material layer (2) and the second material layer (3) in the two side portions (5,6) of the material laminate are intermittently bonded together in a second bond pattern (8), wherein the percentage bonded area in relation to the total area in the two side portions (5,6) is greater than the percentage bonded area in relation to the total area of the central portion (4).

2. A material laminate in accordance with claim 1, **characterized in that** the proportion of bonded area in relation to the total area in the central portion is at least 0.5%-units less than the proportion of bonded area in relation to the total area in the side portions.

5

3. A material laminate in accordance with claim 1, **characterized in that** the proportion of bonded area in relation to the total area in the central portion is between 3% and 6% and the proportion of bonded area in relation to the total area in the side portions is between 5% and 8%.

10

4. A material laminate in accordance with one of claims 1-3, wherein each bond site exhibits a smallest extension and a second extension which is perpendicular to the smallest extension, **characterized in that at** least the smallest extension in the bond sites of the first bond pattern is less than 0.8 millimetres.

15

5. A material laminate in accordance with claim 4, **characterized in that** the smallest extension in the first bond pattern is 0.3 millimetres or less.

20

6. A material laminate in accordance with one of the preceding claims, **characterized in that** the bond sites comprise spot-bonds.

25 7. A material laminate in accordance with one of the preceding claims, **characterized in that** the first material layer is a hydrophobic nonwoven material.

8. A material laminate in accordance with one of the preceding claims, **characterized in that** the second bond pattern is denser than the first bond pattern.

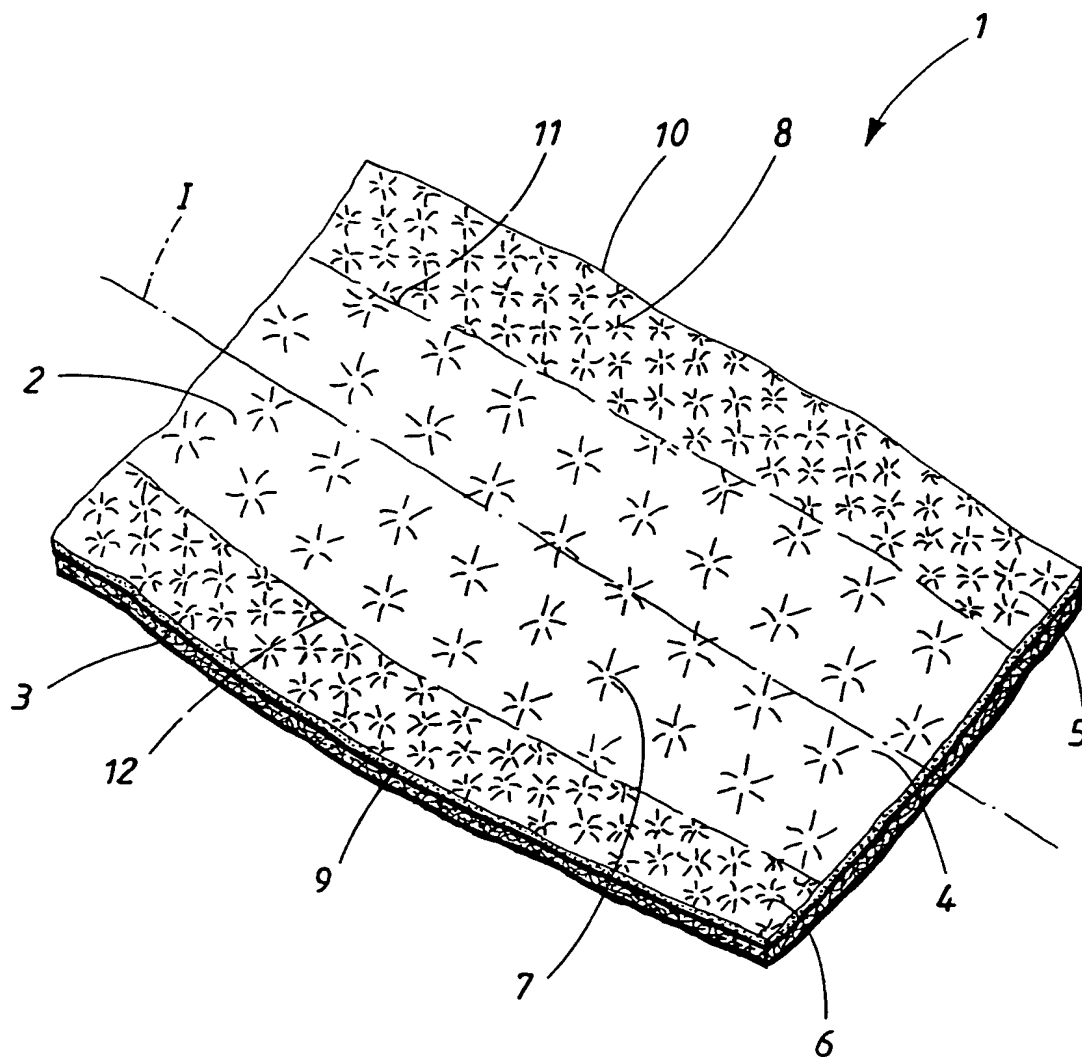
5 9. A material laminate in accordance with one of the preceding claims, **characterized in that** the material laminate is in the form of a coherent, continuous web and that the central portion (4) and the side portions (5,6) extend continuously in the length direction of the continuous web.

10

10. An absorbent article exhibiting a substantially elongated shape with a planar extension, a length direction, a width direction and a thickness direction and exhibiting a central axis extending in the length direction and two opposing side edges (408,409) extending in the length direction and
15 comprising a fluid pervious covering sheet (401), a fluid impervious covering sheet (413) and an absorption body (415) enclosed between the two covering sheets (401,413), **characterized in that** the absorbent article, in the planar extension, exhibits two side portions (405,406) extending in the length direction and each extending in the transverse
20 direction from a respective side edge (408,409) a distance towards the longitudinal central axis of the article and a central portion (404) positioned between the side portions (405,406) in the planar extension of the article, wherein the fluid pervious covering sheet (401) comprises a material laminate (1) in accordance with one of claims 1-9, wherein the material
25 laminate (1), in the central portion of the article exhibits the first bond pattern and the material laminate in the side portions of the absorbent article exhibits the second bond pattern.

11. An absorbent article in accordance with claim 10, **characterized in that** the length extension of the side portions (405,406) in the width direction of the article is at least 4 millimetres along all of the length of the each side portion.

1/4

FIG. 1

2/4

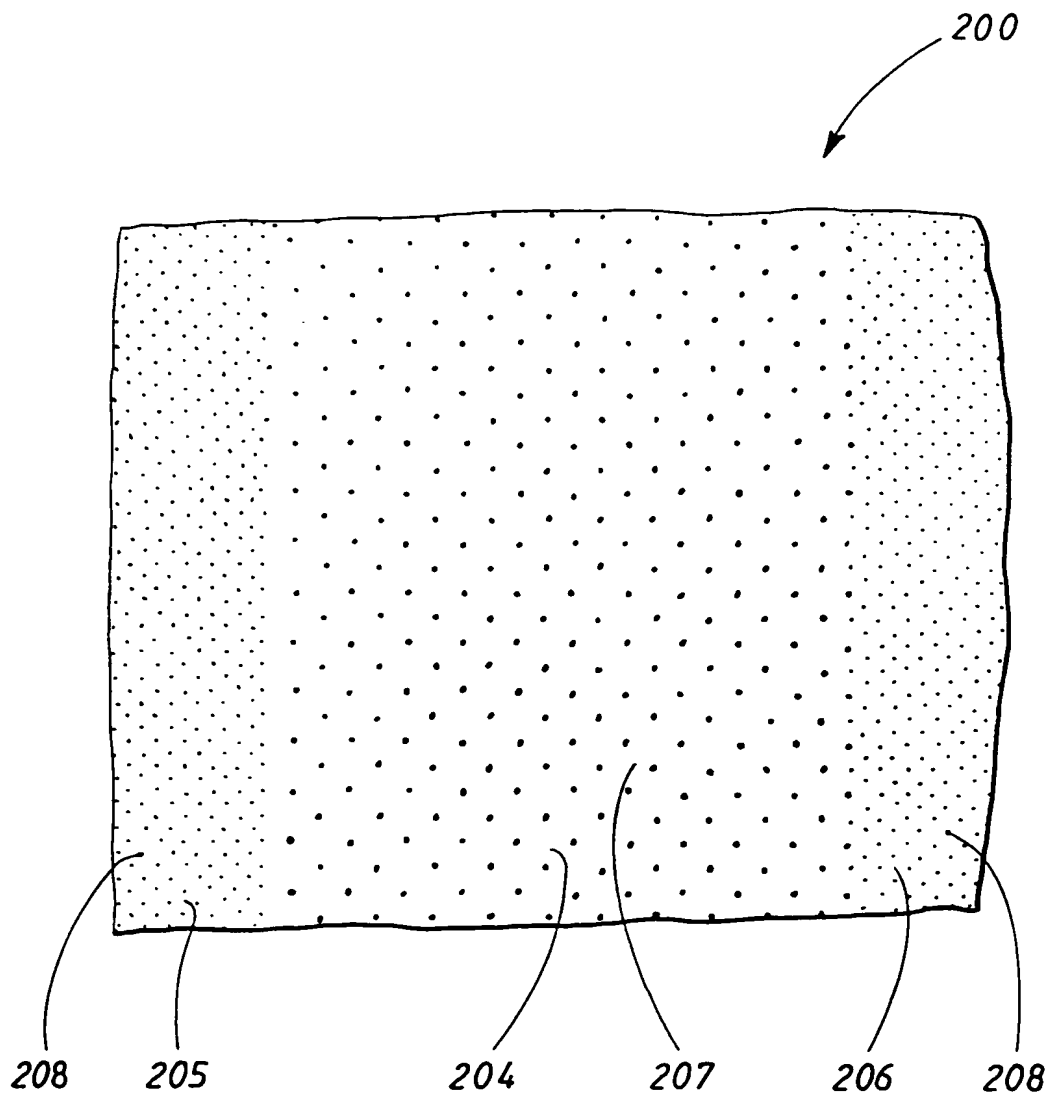


FIG. 2

4/4

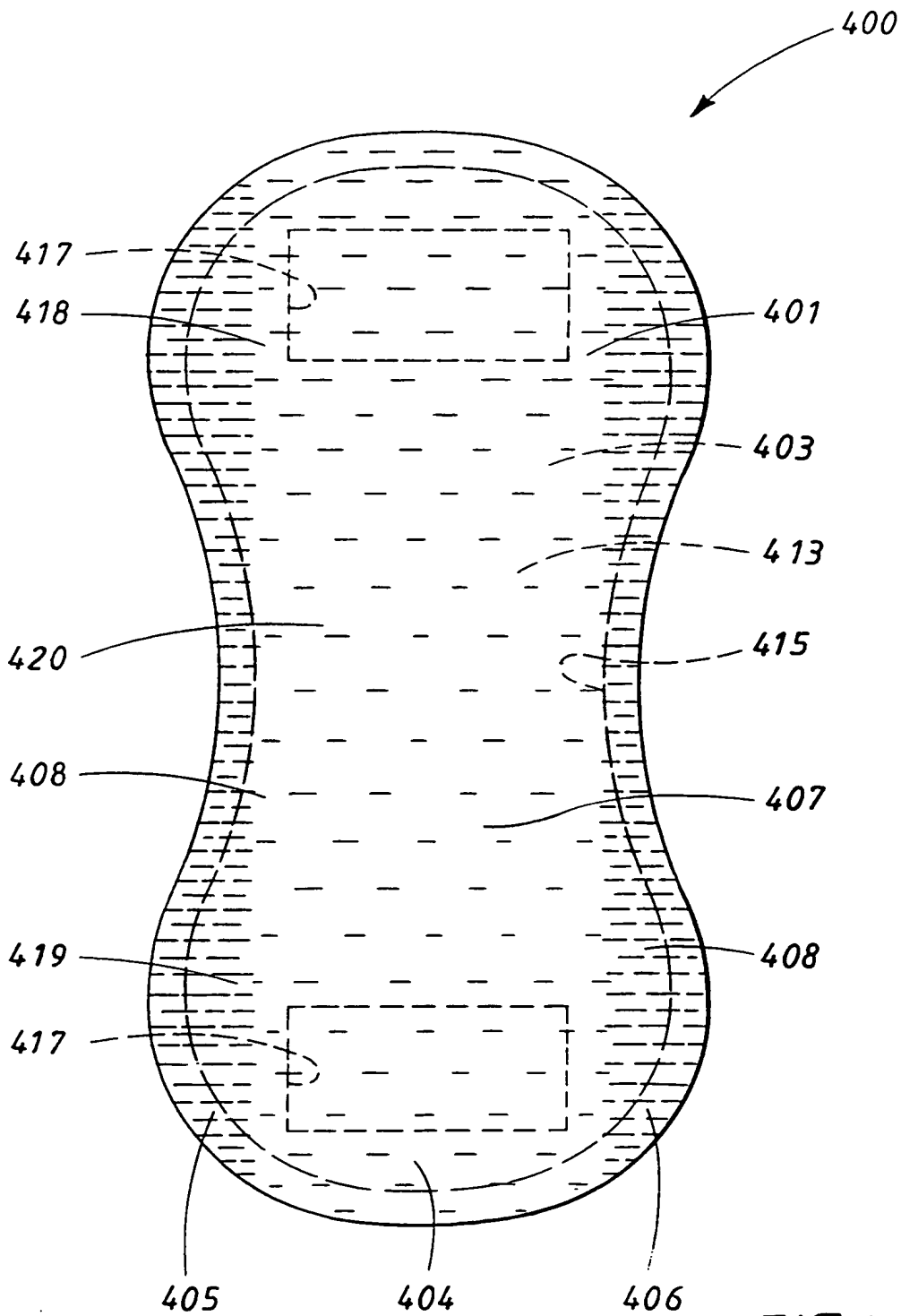


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 00/01405

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: A61F 13/511

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: A61F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 9311725 A1 (THE PROCTER & GAMBLE COMPANY), 24 June 1993 (24.06.93), page 9 last paragraph, page 10 second paragraph, page 24 last paragraph - page 27 first paragraph, page 30 first paragraph, page 31 third paragraph, figure 1, abstract --	1-11
Y	WO 9827904 A1 (THE PROCTER & GAMBLE COMPANY), 2 July 1998 (02.07.98), page 3 last paragraph, page 4 paragraphs 3 and 4, page 7 first paragraph, page 8 paragraphs 3 and 4, claims, figures, abstract --	1-11
A	US 4761322 A (JOHN M. RALEY), 2 August 1988 (02.08.88), claims 1-8, figures, abstract --	1-11

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

18 October 2000

Date of mailing of the international search report

23-10-2000

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 00/01405

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0685214 A (UNI-CHARM CORPORATION), 6 December 1995 (06.12.95), claims, figures, abstract --	1-11
P,A	WO 9949825 A1 (SCA HYGIENE PRODUCTS AB), 7 October 1999 (07.10.99), claims, figures, abstract -----	1-11

INTERNATIONAL SEARCH REPORT -
Information on patent family members

03/10/00

International application No.

PCT/SE 00/01405

Patent document cited in search report			Publication date	Patent family member(s)		Publication date
WO	9311725	A1	24/06/93	AT	150636 T	15/04/97
				AT	169492 T	15/08/98
				AU	677000 B	10/04/97
				AU	679433 B	03/07/97
				AU	709761 B	09/09/99
				AU	1255297 A	29/05/97
				AU	2009397 A	03/07/97
				AU	3074192 A	19/07/93
				AU	3132593 A	19/07/93
				BR	9206924 A	14/11/95
				CA	2124798 A,C	24/06/93
				CA	2125645 A,C	24/06/93
				CN	1079382 A	15/12/93
				CZ	283960 B	15/07/98
				CZ	9401424 A	16/11/94
				DE	69218623 D,T	17/07/97
				DE	69226651 D,T	18/02/99
				DK	617602 T	21/04/97
				EP	0617601 A,B	05/10/94
				SE	0617601 T3	
				EP	0617602 A,B	05/10/94
				SE	0617602 T3	
				ES	2099292 T	16/05/97
				ES	2121872 T	16/12/98
				GR	3022956 T	30/06/97
				HK	1006532 A	00/00/00
				HU	70105 A	28/09/95
				HU	217332 B	28/12/99
				HU	9401797 D	00/00/00
				JP	7502433 T	16/03/95
				JP	8504607 T	21/05/96
				MX	9206492 A	31/08/94
				NZ	245065 A	28/05/96
				NZ	245066 A	27/07/97
				PT	8638 U	30/09/93
				PT	101473 A	30/11/94
				SG	55052 A	21/12/98
				US	5460622 A	24/10/95
				US	5486167 A	23/01/96
				US	5611790 A	18/03/97
				US	5658269 A	19/08/97
				US	5674212 A	07/10/97
				US	5681300 A	28/10/97
				US	5683375 A	04/11/97
				US	5702382 A	30/12/97
				US	5713884 A	03/02/98
				US	5716349 A	10/02/98
				US	5824004 A	20/10/98
				US	5849003 A	15/12/98
				US	6042575 A	28/03/00
				US	6059764 A	09/05/00
				US	6103953 A	15/08/00
				WO	9311726 A	24/06/93

INTERNATIONAL SEARCH REPORT
Information on patent family members

03/10/00

International application No.
PCT/SE 00/01405

Patent document cited in search report			Publication date	Patent family member(s)		Publication date
WO	9827904	A1	02/07/98	AU	1690097 A	17/07/98
				BR	9612817 A	11/01/00
				EP	0973470 A	26/01/00
				NO	992977 A	19/08/99

US	4761322	A	02/08/88	NONE		

EP	0685214	A	06/12/95	AU	696865 B	17/09/98
				AU	2039295 A	14/12/95
				CA	2150876 A,C	04/12/95
				CN	2237432 U	16/10/96
				JP	7328060 A	19/12/95
				US	5613960 A	25/03/97

WO	9949825	A1	07/10/99	AU	2865999 A	18/10/99
				AU	7945198 A	04/01/99
				EP	0922927 A	16/06/99
				GB	2335627 A	29/09/99
				GB	9906187 D	00/00/00
				SE	9801038 A	28/09/99

PATENT COOPERATION TREATY

2001-04- 1 2

From the:
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

ANDERSSON, Per
Albihns Patentbyrå Göteborg AB
P.O. Box 142
S-401 22 Göteborg
SUEDE

SSR 01-05-02

SSS 01-07-10

PCT

WRITTEN OPINION

(PCT Rule 66)

Date of mailing
(day/month/year)

10.04.2001

Applicant's or agent's file reference

111871 ARE

REPLY DUE

within 3 month(s)
from the above date of mailing

International application No.

PCT/SE00/01405

International filing date (day/month/year)

03/07/2000

Priority date (day/month/year)

09/07/1999

International Patent Classification (IPC) or both national classification and IPC

A61F13/511

Applicant

SCA HYGIENE PRODUCTS AB et al.

1. This written opinion is the **first** drawn up by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain document cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

3. The applicant is hereby **invited to reply** to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 09/11/2001.

Name and mailing address of the international preliminary examining authority:



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized officer / Examiner

Martinez, C

Formalities officer (incl. extension of time limits)
de Santiago Gomez, A
Telephone No. +49 89 2399 8224



I. Basis of the opinion

1. With regard to the **elements** of the international application (Replacement *sheets which have been furnished to the receiving Office in response to an invitation under Article 14* are referred to in this opinion as "originally filed"):

Description, pages:

1-17 as published

Claims, No.:

1-11 as published

Drawings, sheets:

1/4-4/4 as published

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	
Inventive step (IS)	Claims	1-11
Industrial applicability (IA)	Claims	

2. Citations and explanations
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Reference is made to the following documents:

- D1: WO-A-9311725, cited in the Search Report and family member of
EP-A-0617602 cited in the description on page 2, lines 25 and 27
D2: WO-A-9827904

Re Item V

The present application does not meet the requirements of Article 33(3) PCT because the subject-matter of the following claims does not appear to involve an inventive step.

Independent claims 10 and 1

Document D1 (cited as a Y document), which is considered to represent the most relevant state of the art, discloses an absorbent article (20) exhibiting a substantially elongated shape with a planar extension, a length direction, a width direction and a thickness direction and exhibiting a central axis extending in the length direction (I) and two opposing side edges (22, 22) extending in the length direction and comprising a fluid pervious covering sheet, a fluid impervious covering sheet (30) and an absorption body (32) enclosed between the two covering sheets (D1: p.8, 2nd paragraph + p.9, 1st paragraph + Fig.1), said absorbent article (20) exhibiting, in the planar extension, two side portions (48, 48) extending in the length direction and each extending in the transverse direction from a respective side edge (22, 22) a distance towards the longitudinal central axis (I) of the article and a central portion (46) positioned between the side portions (48, 48) in the planar extension of the article, wherein the fluid pervious covering sheet comprises a material laminate formed of a first fluid pervious fibrous material layer (28) and a second fluid pervious porous material layer (34) (D1: acquisition layer 34) wherein at least one of the material layers comprises thermoplastic material and wherein the two material layers are mutually connected by bond sites (44) in the covering material laminate, within which bond sites the thermoplastic material has been caused to at least partially soften or melt and thereby bond the two material layers together (D1: p.16, last paragraph to p.17, 1st paragraph + p.10, 2nd paragraph + p.19, 4th paragraph + p.20, 2nd paragraph), wherein the first material layer (28) and the second material layer (34) in the central portion (46) are intermittently bonded together in a first bond pattern (44a) and the first material layer (28) and the second material layer (34) in the two side portions (48, 48) of the material laminate are intermittently bonded together in a second bond pattern (44b) (D1: p.23, 3rd paragraph + p.25, 2nd

paragraph).

The subject-matter of Claim 10 differs from document D1 in that the percentage of bonded areas in relation to the total area in the two side portions (48, 48) is greater than the percentage of bonded areas in relation to the total area of the central portion (46).

The subject-matter of claim 10 therefore appears to be new in the sense of Article 33(2) PCT. This also applies to claim 1. Claim 1 should have been drafted in the two-part form based on document D1 (Rule 6.3(b) PCT).

The technical effects obtained with a repartition of the bond sites as claimed in claim 1 are that there is a smaller risk of the two constituting layers to separate from each other, since the bond sites are distributed over the whole surface of the material laminate, that the covering sheet becomes softer and more comfortable to wear in contact with the skin and that the risk of the central portion taking up liquid at the bond sites is considerably reduced, since the surface closest to the user in the longitudinal central portion of the article does not exhibit as great a portion of bonded area as the longitudinal side portions (see p.5, I.1-13).

According to the data given in document D1 concerning the bond sites (44a, 44b), in particular their bonded area (see p.25, 3rd paragraph) and their density (number of bonds per square inch, see p.26, I.5-7), it seems that the percentage of bonded area in relation to the total area in the two side portions is **smaller** than the percentage of bonded area in relation to the total area of the central portion.

The technical problems to be solved are that the covering sheet and the inside layer loose volume and thereby softness and skin friendliness by thermal bonding, which causes the distance between the absorption body of the article and the body of the user to be reduced, **which increases the risk of fluid penetrating back out of the article and wetting the body of the user**. The layers also have to be sufficiently bonded in order to minimise the risk that they are separated from each other during use (see p.3, 1st paragraph).

Document D2 (cited as a Y document) discloses an absorbent article comprising a

topsheet (38) that is fused to an underlying liquid pervious layer (44) (D2: acquisition component 44) at a plurality of individual bonded areas (52), the absorbent article comprising an unbonded window (54) that is substantially free of bonded areas, which is surrounded by regions of the absorbent article that contain bonded areas (D2: abstract + p.4, paragraphs 3-4 + p.10 + Fig. 1).

Document D2 also aims at providing an absorbent article having improved bonding between the uppermost liquid pervious layers that maintain sustained attachment even under prolonged use, and having liquid pervious layers that are bonded in a manner that does not interfere with the acquisition of liquids into the absorbent layer (see D2: p.3, paragraphs 3-5). In order to achieve these results, document D2 suggests to use a central portion (54) positioned in the liquid receiving zone in the **longitudinal central portion** (16) of the absorbent article which is **substantially free of bonded areas**, so that it provides a structure that does not interfere with the acquisition of liquids into the underlying layers (D2: abstract + p.4. last paragraph + p.11, last paragraph to p.12, 1st paragraph + p.6, l.12-14) and which is defined by **a plurality of fusion bonds (52) which are closely spaced** and preferably located in the first and second end regions (32, 34) and in the **longitudinally side regions (18)** of the sanitary napkin (D2: p.12, paragraph 2-4).

Therefore, by combining documents D1 and D2, it was obvious for the person skilled in the art trying to solve the technical problems mentioned above to arrive at the subject-matter of claim 10. Claim 10 does therefore not seem to involve an inventive step. This also applies to claim 1.

Dependent claims

No positive contribution to inventive step can be seen in the additional features of claims 2 to 9 and claim 11 in the sense of Article 33(3) PCT. For example, the most appropriate proportions of bonded areas in relation to the total area in the central and side portions can be determined by the person skilled in the art depending on the material used and of the thickness of the layers (see p.5, l.25 to p.6, l.7) without the exercise of inventive skill ; the bonding patterns and their dimension can also be selected by the person skilled in the art without the exercise of inventive skill.

Re Item VIII

The present application does not meet the requirements of Article 6 PCT, the reasons being as follows:

Claim 1

The expression "by means of the covering material laminate" in the disclosure "the two material layers are mutually connected by means of the covering material laminate" is not clear as the two material layers are comprised in the covering material laminate. As disclosed in the description (see p.9, l.9-10), it would be clearer to disclose that "the two material layers are mutually connected by bond sites in the material laminate (1) within which bond sites the thermoplastic material ...".

The word "of" has been omitted in the expression "the percentage of bonded area" (see lines 27 and 29 in claim 1).

The expression "or the like" should be deleted as it is very imprecise (see l.6).

Claim 10

The subject-matter of claim 10 appears to cover both embodiments represented in figures 3 and 4, the reference numbers mentioned for the different parts of the absorbent article should therefore be those given in figure 4 and also in figure 3.

Claim 2

The term "-units" should be deleted in claim 2, as disclosed in the description (see p.5, l.19) for clarity sake.

Claim 6

Claim 6 is not in accordance with claim 4 upon which it is dependent, the reasons being that it is not clear how a spot-bond can have a smallest extension and a second extension which is perpendicular to the smallest extension.

Claim 7

The first material layer can only be hydrophobic if it exhibits penetrating apertures so that it is fluid pervious (see p.15, l.5-9), this feature should therefore be specified in claim 7.

**European Patent Office
D-80298 MÜNCHEN
Tyskland**

TO THE INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

**International
Patent Appl.No.
PCT/SE00/01405**

**Our ref
111871**

**Our agent
Anette Romare /ARE**

This is in response to the Written Opinion dated 10 April 2001.

Please find enclosed new pages 18-21 with amended Claims 1-11. In view of D1 (WO 93/11725), which is taken as closest prior art, Claims 1 and 10 have been amended by moving the characterising portion. Hence, the feature that the material laminate and the absorbent article are divided into a central portion and side portions is now found in the preamble of Claims 1 and 10. Moreover, since there is no explicit disclosure in D1 of a covering laminate consisting of a first fibrous layer and a second porous layer (see discussion below), the feature of the first layer being a fibrous layer is moved to the characterising portion of Claim 1. Further amendments to the Claims are made in response to the objections under Item VIII, as set out below.

We submit that neither D1, WO 93/11725, nor D2, WO 98/27904 disclose a material laminate for use as a covering sheet for absorbent articles and comprising a first fibrous material layer and a second porous material layer. Both D1 and D2 describe in detail laminates comprising an upper perforated plastic film and a lower fibrous layer serving as a fluid acquisition layer. Although D1 and D2 mention generally that fibrous covering sheets may be used, there is no indication of the particular difficulties encountered when using such covering sheets or of their combination with a further layer in a laminate. Accordingly, neither D1 nor D2 explicitly teach a first fibrous layer in combination with a second, porous layer or suggest that such a combination would produce an optimal combination of softness and dryness. Moreover, all embodiments disclosed in D1 and D2 relate to a surface material having a first layer of perforated plastic film and this is also the focus of the teaching of the rest of the specifications in D1 and D2.

The major reason for using fibrous materials as covering materials for absorbent articles which are intended to come into contact with the skin of a user is that fibrous materials have a textile character and, for this reason, are perceived as being more comfortable to carry against the skin since they are less occlusive than plastic films. Moreover, fibrous materials are softer and are perceived to be less chafing or otherwise irritating to the skin. However, a disadvantage with fibrous covering materials is that they tend to retain

a portion of the liquid after wetting, resulting in a moist surface and a wet or soiled visual impression. The purpose of the present invention is to improve fluid transport through a fibrous covering sheet while retaining the soft, textile character of the covering material. This problem is not at all mentioned or discussed in either of D1 and D2.

To the contrary, on page 26 D1 teaches that large bonding areas "can be used without interfering with acquisition of liquids". This might be a true statement for covering sheets having an outer perforated plastic film layer. However, when the covering sheet is a fibrous material, as is the case in the present invention, the fluid transmitting properties as well as the dryness and softness of the material are negatively affected by large bonds. A perforated plastic film is provided with relatively large, penetrating holes which remain in the film even after bonding to a second, underlying layer. In contrast thereto, a fibrous layer passes liquid through the layer in the multiplicity of fine capillary spaces which are defined between individual fibres in the material. Thermobonding of a fibrous layer with another layer destroys the fibrous structure in the bond areas and the number of capillaries in the material is drastically reduced. This implies that the fluid acquisition and transporting ability of the material is reduced to a corresponding degree. Moreover, the bonds have the additional effect of compressing the fibrous structure in areas surrounding the bond areas. Such compression reduces the size of the capillaries around the bond areas causing the compressed areas to have an increased tendency of attracting and retaining liquid.

Apart from the negative effect on the fluid handling properties of the first material layer, the bonds have a negative effect on the softness and the textile character of a fibrous material. Thermobonding causes a thermoplastic material to soften or melt whereby the bonded area loses its fibrous character and partially or completely takes on the appearance of a plastic film material. If the bond areas are large, as suggested in D1, there is a risk that the covering sheet will almost completely lose its textile character. This is undesirable for several reasons. The material will, for instance, be less breathable and lose its softness. In addition, the edges of the bond areas are often perceived as hard and chafing. Moreover, the material will have a visual appearance which is considerably less "textile" than a material with comparatively small and few bond areas.

In order for fluid to be able to be transferred from a first fibrous material to a second porous material it is necessary that the layers be held in intimate contact during use. Hence, it is necessary that the layers be sufficiently strongly bonded to each other to prevent separation of the layers during use. For this reason, the embodiment taught in D2, wherein a bond-free area is centrally arranged is not useful when the upper layer is a fibrous layer. However, with a perforated film layer, as in D2, it is not critical that the layers are bonded together over all of their common surfaces, since the holes in the perforated plastic film are of a much larger dimension than the capillaries in a fibrous layer. Hence, fluid transport through a perforated film is not strongly dependent on close contact with an underlying layer in order to drain fluid from the perforated plastic film. Instead, fluid transport through a perforated plastic film is primarily governed by gravitation and by the shape of the holes.

Consequently, it is submitted that the person skilled in the art cannot derive any information from D1 or D2 either alone or in combination about how to arrange bonds over the surface of a covering laminate wherein the upper layer is a fibrous layer. Since both D1 and D2 are directed towards laminates having an upper layer of a perforated plastic film and since perforated plastic films, as has been explained in the foregoing differ in many important aspects from fibrous materials, D1 and D2 teach directly away from the present invention. Accordingly, when reading D1, the person skilled in the art is brought the impression that the bond area does not negatively affect the properties of the material laminate. Hence, in view of D1, there is no reason for the person skilled in the art to make a covering laminate having a smaller percentage bonded area in a central portion of the laminate which is expected to be first wet by fluid than in side portions of the laminate. D2 conveys the misleading impression that, in a central area, no bonds whatsoever are needed.

Moreover, with regard to item VIII of the Written Opinion:

Claim 1

Claim 1 has been amended as suggested by the Examiner.

Claim 10 (and Claim 11)

Reference numerals relating to Fig. 3 have been inserted into Claims 10 and 11.

Claim 2

The term “-units” has been deleted.

Claim 6

Claim 6 have been made dependent only on one of claims 1-3.

Claim 7

It is submitted that a fibrous first layer can be hydrophobic and still be able to pass liquid through its interstices, particularly if the fibrous layer is connected to a second layer which is hydrophilic and which will aid in transporting liquid through the first layer. Hence, it is not necessary that a hydrophobic fibrous layer is provided with perforations in order to be able to pass liquid therethrough. Consequently, no amendment has been made to Claim 7.

In conclusion, there is no disclosure in D1 or D2 of a material laminate in accordance with claim 1 of the present patent application or of an absorbent article in accordance with claim 10. Moreover, for the reasons explained above, the person skilled in the art would not modify the prior art laminates in order to achieve what is claimed in claim 1.

Hence the material laminate of claim 1 and the absorbent article of claim 10 is believed to be both novel and inventive.

Göteborg, 5 July 2001

.....
Anette Romare

Enc. (In triplicate) Substitute pages 18-21.

CLAIMS:

- 5 1. A material laminate for use as a covering sheet for absorbent articles
such as a sanitary napkin, an incontinence protector or a diaper with a
planar extension, a length direction, a width direction and a thickness
direction and exhibiting a central axis extending in the length direction and
two opposing side edges (9,10) extending in the length direction and
10 comprising, in the thickness direction, a first fluid pervious material layer (2)
and a second fluid pervious porous material layer wherein at least one of the
material layers comprises thermoplastic material and wherein the two
material layers are mutually connected by bond sites in the material
saminete (1) within which bond sites the thermoplastic material has been
15 caused to at least partially soften or melt and thereby bond the two material
layers together, and wherein the material laminate (1), in the planar
extension, further exhibits two side portions (5,6) extending in the length
direction and each extending a distance in the transverse direction from a
respective side edge (9,10) towards the longitudinal central axis of the
20 material laminate (1) and a central portion (4) positioned between the side
portions (5,6) in the planar extension of the material laminate (1) wherein the
first material layer (2) and the second material layer (3) in the central portion
(4) of the material laminate are intermittently bonded together in a first bond
pattern (7) and the first material layer (2) and the second material layer (3) in
25 the two side portions (5,6) of the material laminate are intermittently bonded
together in a second bond pattern (8), **characterized in that** the first fluid
pervious material layer (2) is a fibrous layer and in that the percentage of
bonded area in relation to the total area in the two side portions (5,6) is
greater then the percentage of bonded area in relation to the total area of
30 the central portion (4).

2. A material laminate in accordance with claim 1,
characterized in that the proportion of bonded area in relation to
the total area in the central portion is at least 0.5% less than the proportion
of bonded area in relation to the total area in the side portions.
- 5
3. A material laminate in accordance with claim 1,
characterized in that the proportion of bonded area in relation to
the total area in the central portion is between 3% and 6% and the
proportion of bonded area in relation to the total area in the side portions is
10 between 5% and 8%.
4. A material laminate in accordance with one of claims 1-3, wherein each
bond site exhibits a smallest extension and a second extension which is
perpendicular to the smallest extension, **characterized in that at**
15 least the smallest extension in the bond sites of the first bond pattern is less
than 0.8 millimetres.
5. A material laminate in accordance with claim 4,
characterized in that the smallest extension in the first bond
20 pattern is 0.3 millimetres or less.
6. A material laminate in accordance with one of claims 1-3,
characterized in that the bond sites comprise spot-bonds.
- 25 7. A material laminate in accordance with one of the preceding claims,
characterized in that the first material layer is a hydrophobic
nonwoven material.

8. A material laminate in accordance with one of the preceding claims, **characterized in that** the second bond pattern is denser than the first bond pattern.

5 9. A material laminate in accordance with one of the preceding claims, **characterized in that** the material laminate is in the form of a coherent, continuous web and that the central portion (4) and the side portions (5,6) extend continuously in the length direction of the continuous web.

10

10. An absorbent article exhibiting a substantially elongated shape with a planar extension, a length direction, a width direction and a thickness direction and exhibiting a central axis extending in the length direction and two opposing side edges (308,309; 408,409) extending in the length
15 direction and comprising a fluid pervious covering sheet (301; 401), a fluid impervious covering sheet (313; 413) and an absorption body (315; 415) enclosed between the two covering sheets (301,313; 401,413), and wherein the absorbent article, in the planar extension, exhibits two side portions (305,306; 405,406) extending in the length direction and each extending in
20 the transverse direction from a respective side edge (308,309; 408,409) a distance towards the longitudinal central axis of the article and a central portion (304; 404) positioned between the side portions (305,306; 405,406) in the planar extension of the article, **characterized in that** the fluid pervious covering sheet (301; 401) comprises a material laminate (1) in
25 accordance with one of claims 1-9, wherein the material laminate (1), in the central portion of the article exhibits the first bond pattern and the material laminate in the side portions of the absorbent article exhibits the second bond pattern.

11. An absorbent article in accordance with claim 10, **characterized in that** the length extension of the side portions (305,306; 405,406) in the width direction of the article is at least 4 millimetres along all of the length of the each side portion.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 111871 ARE	FOR FURTHER ACTION		See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/SE00/01405	International filing date (day/month/year) 03/07/2000	Priority date (day/month/year) 09/07/1999	
International Patent Classification (IPC) or national classification and IPC A61F13/511			
Applicant SCA HYGIENE PRODUCTS AB et al.			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 24/01/2001	Date of completion of this report 20.07.2001
Name and mailing address of the international preliminary examining authority: <div style="display: flex; align-items: center;"> <div> European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 </div> </div>	Authorized officer Martinez, C Telephone No. +49 89 2399 7510



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/SE00/01405

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-17 as published

Claims, No.:

1-11 with telefax of 05/07/2001

Drawings, sheets:

1/4-4/4 as published

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/SE00/01405

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims 1-11
	No: Claims
Inventive step (IS)	Yes: Claims
	No: Claims 1-11
Industrial applicability (IA)	Yes: Claims 1-11
	No: Claims

2. Citations and explanations
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/SE00/01405

Reference is made to the following documents:

- D1: WO-A-9311725, cited in the Search Report and family member of
EP-A-0617602 cited in the description on page 2, lines 25 and 27
D2: WO-A-9827904

Re Item V

The present application does not meet the requirements of Article 33(3) PCT because the subject-matter of the following claims does not appear to involve an inventive step.

Independent claims 10 and 1

Document D1 (cited as a Y document), which is considered to represent the most relevant state of the art, discloses an absorbent article (20) exhibiting a substantially elongated shape with a planar extension, a length direction, a width direction and a thickness direction and exhibiting a central axis extending in the length direction (I) and two opposing side edges (22, 22) extending in the length direction and comprising a fluid pervious covering sheet, a fluid impervious covering sheet (30) and an absorption body (32) enclosed between the two covering sheets (D1: p.8, 2nd paragraph + p.9, 1st paragraph + Fig.1), said absorbent article (20) exhibiting, in the planar extension, two side portions (48, 48) extending in the length direction and each extending in the transverse direction from a respective side edge (22, 22) a distance towards the longitudinal central axis (I) of the article and a central portion (46) positioned between the side portions (48, 48) in the planar extension of the article, wherein the fluid pervious covering sheet comprises a material laminate formed of a first fluid pervious material layer (28), which can be a **fibrous** material layer (D1: p.10, 2nd paragraph), and a second fluid pervious porous material layer (34) (D1: acquisition layer 34) wherein at least one of the material layers comprises thermoplastic material and wherein the two material layers are mutually connected by bond sites (44) in the covering material laminate, within which bond sites the thermoplastic material has been caused to at least partially soften or melt and thereby bond the two material layers together (D1: p.16, last paragraph to p.17, 1st paragraph + p.10, 2nd paragraph + p.19, 4th paragraph + p.20, 2nd paragraph), wherein the first material layer (28) and the second material layer (34) in the central portion (46) are intermittently bonded together in a first bond pattern (44a) and the first material layer (28) and the second material layer (34) in the two side portions (48, 48) of the material laminate are intermittently

bonded together in a second bond pattern (44b) (D1: p.23, 3rd paragraph + p.25, 2nd paragraph).

The subject-matter of Claim 10 differs from document D1 in that the percentage of bonded areas in relation to the total area in the two side portions (48, 48) is greater than the percentage of bonded areas in relation to the total area of the central portion (46).

The subject-matter of claim 10 therefore appears to be new in the sense of Article 33(2) PCT. This also applies to claim 1.

With respect to Rule 6.3(b) PCT, the feature being that "the first fluid pervious material layer (2) is a **fibrous** layer" should have been specified in the preamble of claim 1 since it is known from document D1 (D1: p.10, l.15-25)).

The technical effects obtained with a repartition of the bond sites as claimed in claim 1 are that there is a smaller risk of the two constituting layers to separate from each other, since the bond sites are distributed over the whole surface of the material laminate, that the covering sheet becomes softer and more comfortable to wear in contact with the skin and that the risk of the central portion taking up liquid at the bond sites is considerably reduced, since the surface closest to the user in the longitudinal central portion of the article does not exhibit as great a portion of bonded area as the longitudinal side portions (see p.5, l.1-13).

According to the data given in document D1 concerning the bond sites (44a, 44b), in particular their bonded area (see p.25, 3rd paragraph) and their density (number of bonds per square inch, see p.26, l.5-7), it seems that the percentage of bonded area in relation to the total area in the two side portions is **smaller** than the percentage of bonded area in relation to the total area of the central portion.

The technical problems to be solved are that the covering sheet and the inside layer loose volume and thereby softness and skin friendliness by thermal bonding, which causes the distance between the absorption body of the article and the body of the user to be reduced, **which increases the risk of fluid penetrating back out of the article and wetting the body of the user**. The layers also have to be sufficiently bonded in order to minimise the risk that they are separated from each other during use (see p.2,

I.25 to p.3, I.17).

Document D2 (cited as a Y document) discloses an absorbent article comprising a topsheet (38), which can be a woven or a nonwoven material, i.e. a **fibrous** material layer (D2: p.7, 1st paragraph) and which is fused to an underlying liquid pervious layer (44) (D2: acquisition component 44) at a plurality of individual bonded areas (52), the absorbent article comprising an unbonded window (54) that is substantially free of bonded areas, which is surrounded by regions of the absorbent article that contain bonded areas (D2: abstract + p.4, paragraphs 3-4 + p.10 + Fig. 1).

Document D2 also aims at providing an absorbent article having improved bonding between the uppermost liquid pervious layers that maintain **sustained attachment** even under prolonged use (D2: p.3, 3rd and 4th paragraphs), and having liquid pervious layers that are bonded in a manner that does not interfere with the acquisition of liquids into the absorbent layer (D2: p.3, 5th paragraph). In order to achieve these results, document D2 suggests to use a central portion (54) positioned in the liquid receiving zone in the **longitudinal central portion** (16) of the absorbent article which is **substantially free of bonded areas**, so that it provides a structure that does not interfere with the acquisition of liquids into the underlying layers (D2: abstract + p.4. last paragraph + p.11, last paragraph to p.12, 1st paragraph + p.6, I.12-14) and which is defined by a **plurality of fusion bonds (52) which are closely spaced** and preferably located in the first and second end regions (32, 34) and in the **longitudinally side regions (18)** of the sanitary napkin (D2: p.12, paragraph 2-4).

Therefore, by combining documents D1 and D2, it was obvious for the person skilled in the art trying to solve the technical problems mentioned above to arrive at the subject-matter of claim 10. Claim 10 does therefore not seem to involve an inventive step. This also applies to claim 1.

Dependent claims

No positive contribution to inventive step can be seen in the additional features of claims 2 to 9 and claim 11 in the sense of Article 33(3) PCT. For example, the most appropriate proportions of bonded areas in relation to the total area in the central and side portions can be determined by the person skilled in the art depending on the material used and of the thickness of the layers (see p.5, I.25 to p.6, I.7) without the exercise of inventive skill ; the bonding patterns and their dimension can also be selected by the person skilled in the art without the exercise of inventive skill.

CLAIMS:

- 5 1. A material laminate for use as a covering sheet for absorbent articles
such as a sanitary napkin, an incontinence protector, a diaper, or the like
with a planar extension, a length direction, a width direction and a thickness
direction and exhibiting a central axis extending in the length direction and
two opposing side edges (9,10) extending in the length direction and
10 comprising, in the thickness direction, a first fluid pervious fibrous material
layer (2) and a second fluid pervious porous material layer wherein at least
one of the material layers comprises thermoplastic material and wherein the
two material layers are mutually connected by means of the covering
material laminate exhibiting bond sites within which the thermoplastic
15 material has been caused to at least partially soften or melt and thereby
bond the two material layers together **characterized in that**
the material laminate (1), in the planar extension, further exhibits two side
portions (5,6) extending in the length direction and each extending a
distance in the transverse direction from a respective side edge (9,10)
20 towards the longitudinal central axis of the material laminate (1) and a
central portion (4) positioned between the side portions (5,6) in the planar
extension of the material laminate (1) wherein the first material layer (2) and
the second material layer (3) in the central portion (4) of the material
laminate are intermittently bonded together in a first bond pattern (7) and the
25 first material layer (2) and the second material layer (3) in the two side
portions (5,6) of the material laminate are intermittently bonded together in a
second bond pattern (8), wherein the percentage bonded area in relation to
the total area in the two side portions (5,6) is greater than the percentage
bonded area in relation to the total area of the central portion (4).

2. A material laminate in accordance with claim 1, **characterized in that** the proportion of bonded area in relation to the total area in the central portion is at least 0.5%-units less than the proportion of bonded area in relation to the total area in the side portions.

5

3. A material laminate in accordance with claim 1, **characterized in that** the proportion of bonded area in relation to the total area in the central portion is between 3% and 6% and the proportion of bonded area in relation to the total area in the side portions is between 5% and 8%.

10

4. A material laminate in accordance with one of claims 1-3, wherein each bond site exhibits a smallest extension and a second extension which is perpendicular to the smallest extension, **characterized in that at** least the smallest extension in the bond sites of the first bond pattern is less than 0.8 millimetres.

15

5. A material laminate in accordance with claim 4, **characterized in that** the smallest extension in the first bond pattern is 0.3 millimetres or less.

20

6. A material laminate in accordance with one of the preceding claims, **characterized in that** the bond sites comprise spot-bonds.

25 7. A material laminate in accordance with one of the preceding claims, **characterized in that** the first material layer is a hydrophobic nonwoven material.

8. A material laminate in accordance with one of the preceding claims, **characterized in that** the second bond pattern is denser than the first bond pattern.

5 9. A material laminate in accordance with one of the preceding claims, **characterized in that** the material laminate is in the form of a coherent, continuous web and that the central portion (4) and the side portions (5,6) extend continuously in the length direction of the continuous web.

10

10. An absorbent article exhibiting a substantially elongated shape with a planar extension, a length direction, a width direction and a thickness direction and exhibiting a central axis extending in the length direction and two opposing side edges (408,409) extending in the length direction and
15 comprising a fluid pervious covering sheet (401), a fluid impervious covering sheet (413) and an absorption body (415) enclosed between the two covering sheets (401,413), **characterized in that** the absorbent article, in the planar extension, exhibits two side portions (405,406) extending in the length direction and each extending in the transverse
20 direction from a respective side edge (408,409) a distance towards the longitudinal central axis of the article and a central portion (404) positioned between the side portions (405,406) in the planar extension of the article, wherein the fluid pervious covering sheet (401) comprises a material laminate (1) in accordance with one of claims 1-9, wherein the material
25 laminate (1), in the central portion of the article exhibits the first bond pattern and the material laminate in the side portions of the absorbent article exhibits the second bond pattern.

11. An absorbent article in accordance with claim 10, **characterized in that** the length extension of the side portions (405,406) in the width direction of the article is at least 4 millimetres along all of the length of the each side portion.

RECORD COPY

REQUEST

The undersigned request that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only	
International Application No.	PCT/SE 00 / 0 1 4 0 5
International Filing Date	0 3 -07- 2000
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> The Swedish Patent Office PCT International Application </div>	
Name of receiving Office and "PCT International Application"	
Applicant's or agent's file reference 111871 ARE (if desired) (12 characters maximum)	

Box No. I TITLE OF INVENTION	
A material laminate for use as a covering sheet in an absorbent article	
Box No. II APPLICANT	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.)	
SCA Hygiene Products AB S-405 03 GÖTEBORG Sweden	
<input type="checkbox"/> This person is also inventor.	
Telephone No. Facsimile No. Teleprinter No.	
State (that is, country) of nationality: Sweden	State (that is, country) of residence: Sweden
This person is the applicant for the purposes of: <input type="checkbox"/> all designated States <input checked="" type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)	
Name and address: Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.)	
<p>26/se</p> <input checked="" type="checkbox"/> Bror-Inge HELMFRIDSSON Rävekärsvägen 4 S-433 50 PARTILLE Sweden	
This person is: <input type="checkbox"/> applicant only <input checked="" type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only (If this check-box is marked, do not fill in below.)	
State (that is, country) of nationality: Sweden	State (that is, country) of residence: Sweden
This person is the applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
<input checked="" type="checkbox"/> Further applicants and/or (further) inventors are indicated on a continuation sheet.	
Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE	
The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: <input checked="" type="checkbox"/> agent <input type="checkbox"/> common representative	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)	
ANDERSSON Per, BERGQUIST Gunnar, BRUN Jonny, GRAUDUMS Valdis, HARRISON Michael, MOSSMARK Anders, OLSSON Stefan, ROMARE Anette, ROSANDER Bengt, SCHLOSSMAN Ulf, SÖRSDAHL Petter ALBIHNS PATENTBYRÅ GÖTEBORG AB, P.O. Box 142, S-401 22 GÖTEBORG, Sweden	
Telephone No. +46 31 725 81 00	
Facsimile No. +46 31 711 95 55	
Teleprinter No.	
<input type="checkbox"/> Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.	

03 -07- 2000

Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

If none of the following sub-boxes is used, this sheet is not to be included in the request.

Name and address: *Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.*

Stefan LINDGREN
Slättervägen 17
S-434 40 KUNGSBACKA
Sweden

This person is:

- ☐ applicant only
☒ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality: Sweden

State (i.e. country) of residence: Sweden

This person is the applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: *Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.*

Urban NILSSON
Pl. 3792 Veneröd
S-442 95 KUNGÄLV
Sweden

This person is:

- ☐ applicant only
☒ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality: Sweden

State (i.e. country) of residence: Sweden

This person is the applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: *Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.*

This person is:

- ☐ applicant only
☐ applicant and inventor
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:

State (i.e. country) of residence:

This person is the applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: *Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.*

This person is:

- ☐ applicant only
☐ applicant and inventor
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- ☒ **EP European Patent:** **AT** Austria, **BE** Belgium, **CH and LI** Switzerland and Liechtenstein, **CY** Cyprus, **DE** Germany, **DK** Denmark, **ES** Spain, **FI** Finland, **FR** France, **GB** United Kingdom, **GR** Greece, **IE** Ireland, **IT** Italy, **LU** Luxembourg, **MC** Monaco, **NL** Netherlands, **PT** Portugal, **SE** Sweden, and any other State which is Contracting State of the European Patent Convention and of the PCT
- ☒ **OA OAPI Patent:** **BF** Burkina Faso, **BJ** Benin, **CF** Central African Republic, **CG** Congo, **CI** Côte d'Ivoire, **CM** Cameroon, **GA** Gabon, **GN** Guinea, **GW** Guinea-Bissau, **ML** Mali, **MR** Mauritania, **NE** Niger, **SN** Senegal, **TD** Chad, **TG** Togo, and any other State which is member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line).....

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- | | |
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03-07-2000

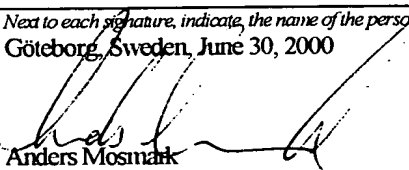
Box No. VI PRIORITY CLAIM		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country:	regional application:* regional Office	international application: receiving Office
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Box No. VIII CHECK LIST; LANGUAGE OF FILING	
This international application contains the following number of sheets: request: 4 ✓ description (excluding sequence listing part): 16 ✓ claims: 3 ✓ abstract: 1 ✓ drawings: 4 ✓ sequence listing part of description: _____ Total number of sheets: 28	This international application is accompanied by the item(s) marked below: 1. <input type="checkbox"/> fee calculation sheet 2. <input checked="" type="checkbox"/> separate signed power of attorney 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: 4. <input type="checkbox"/> statement explaining lack of signature 5. <input type="checkbox"/> priority document(s) identified in Box No. VI as item(s): 6. <input checked="" type="checkbox"/> translation of international application into (language): English ✓ 7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material 8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form 9. <input checked="" type="checkbox"/> other (specify): Copy of Int. Type Search Report and Office Action
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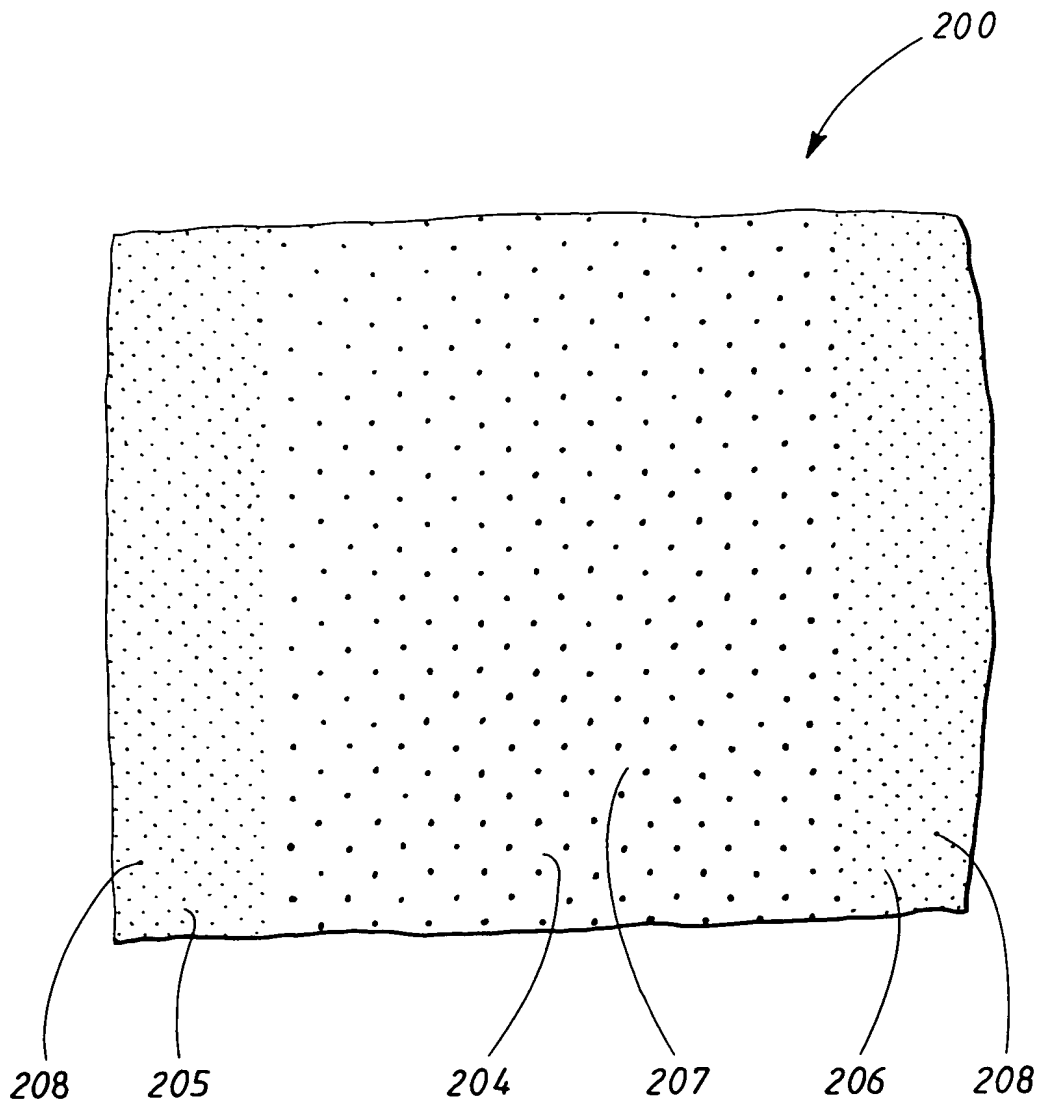


FIG. 2

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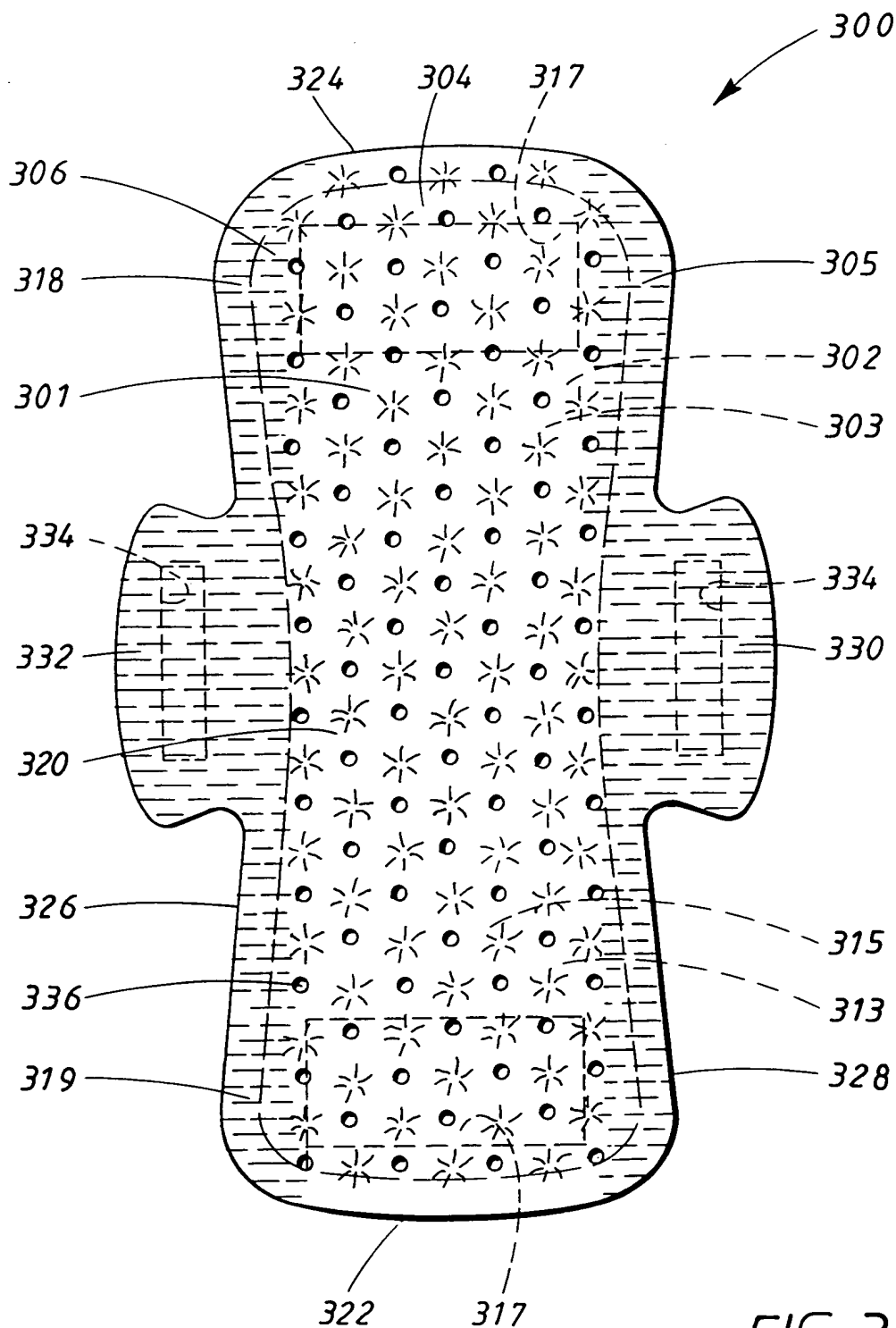


FIG. 3

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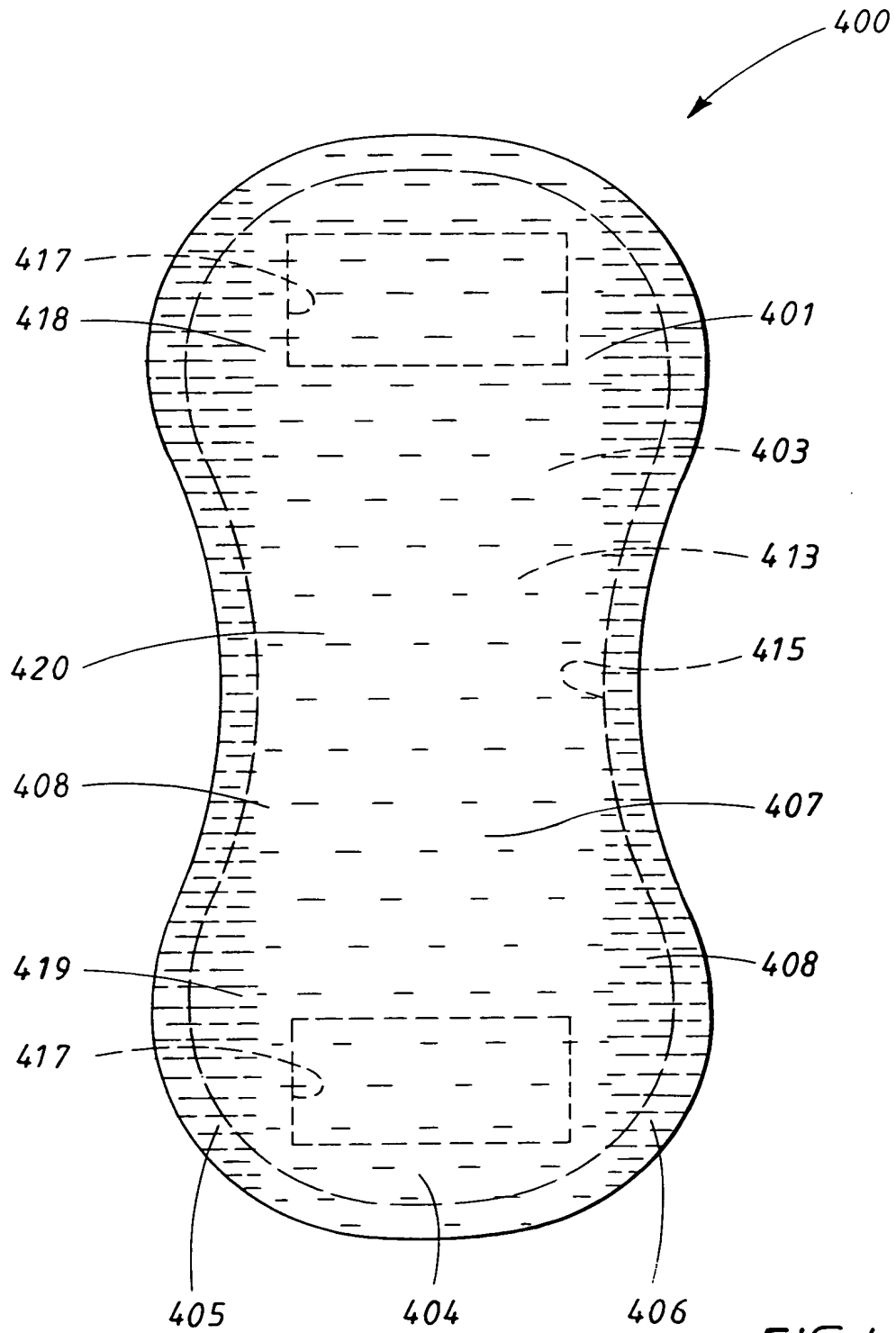


FIG.4

MATERIALLAMINAT FÖR ANVÄNDNING SOM YTSKIKT PÅ ABSORBERANDE ALSTER

TEKNISKT OMRÅDE:

5

Uppfinningen avser ett materiallaminat för användning som ytskikt på absorberande alster såsom dambindor, inkontinensskydd, blöjor, byxblöjor eller liknande. Materiallaminatet innefattar ett första vätskegenomsläppligt fibröst materialskikt och ett andra vätskegenomsläppligt poröst materialskikt, 10 varvid åtminstone ett av de två materialskikten innefattar termoplastiskt material varvid de två materialskikten är inbördes förbundna genom att ytmateriallaminatet uppvisar bindningställen inom vilka det termoplastiska materialet bringats att åtminstone delvis mjukna eller smälta och därigenom sammanbinda de båda materialskikten. Uppfinningen avser även ett 15 absorberande alster innefattande materiallaminatet.

BAKGRUND:

20 För vätskegenomsläppliga ytskikt till absorberande alster av detta slag, vilka är avsedda att vid användningen anligga mot användarens kropp, ställs det höga krav på såväl mjukhet som torrhet.

Det har emellertid visat sig vara svårt att åstadkomma ett 25 vätskegenomsläppligt ytskikt med en mjuk och textilliknande yta som förblir torr även efter upprepade vätningar i samband med att ytskiktet används på ett absorberande alster.

Det är känt att använda nonwovenmaterial för att skapa en mjuk och len yta 30 på ett absorberande alster. För att erhålla en torr yta närmast mot användarens hud, är det även känt att använda hydrofoba nonwovenmaterial, vilka är hålgjorda så att öppningar skapas i materialet

som är större än hålrummen mellan fibrerna i nonwovenmaterialet. Vätskan leds därigenom genom de hålgjorda öppningarna genom ytmaterialet ned till ett underliggande, absorberande materialskikt.

- 5 För att sammanbinda ytskiktet med det innanförliggande skiktet är det vanligt förekommande att använda lim. Dagens limmer är emellertid vanligtvis relativt hydrofoba, vilket medför att vätskeöverföringen från ytskiktet till det innanförliggande skiktet försvåras. Vid användning av ett mer hydrofilt lim finns det risk för att limmet migrerar in i det hydrofoba nonwovenskiktet
- 10 närmast mot användaren, vilket medför att ytan närmast mot användaren efter en första vätning kan upplevas som våt. Ett annat problem som är förknippat med limmade materiallaminat där ett av de ingående skikten är perforerat, är att limmet i perforeringarna under användningen kan verka irriterande mot användarens hud. Vid tillverkningen av laminatet är det även
- 15 ett problem att det lim som hamnar i perforeringarna riskerar att överföras till maskinens transportbana. Ytterligare ett problem som är förknippat med alster som uppvisar ett ytskikt som är perforerat och limmat till ett innanförliggande skikt, är risk för limgenomslag vid vikningen av de färdigtillverkade alstren.

20

- Det är även känt, exempelvis genom EP 0,685,214 och EP 0,617,602 att binda samman ytskiktet med det innanförliggande skiktet genom sammansmältning av skikten i ett bindningsmönster. I EP 0,617,602 binds ett ytskikt som utgörs av en film termiskt med ett innanförliggande materialskikt
- 25 genom att skikten i specifika bindningsområden smälts samman. Bindningarna utgörs exempelvis av cirkulära bindningsområden.

- Det har vid termisk sammanbindning emellertid visat sig att ytmaterialet och det innanförliggande skiktet förlorar volym och därmed mjukhet och
- 30 hudvänlighet. De termiska bindningarna medför vidare att ytskiktets yta blir styvare och därmed mindre komfortabelt att bära i anliggning mot huden. Genom att bindningarna minskar ytskiktets och det innanförliggande skiktets

volym, d v s dess tjocklek, minskar dessutom avståndet mellan alstrets absorptionskropp och användarens kropp. Det medför att risken för att vätska skall tränga tillbaka ut ur alstret och väta användarens kropp är förhöjd. Det har även visat sig att de termiska bindningarna påverkar vätskeupptagningen

5 i det närmast användaren belägna ytskiktet så att ytan närmast användarens kropp efter en första vätning upplevs som våt.

Ett annat problem vid användning av absorberande alster av nämnda slag, är att de utsätts för mekaniska påfrestningar av olika slag. För att minimera

10 risken för att de ingående skikten under användning av alstret separeras från varandra, är det därför viktigt att de ingående skikten i det absorberande alstret är tillräckligt fast förbundna med varandra.

Vidare skall sammanbindningen vara sådan att vätskeöverföringsförmågan

15 mellan de ingående skikten är god, att alstret uppvisar låg återvätning, samt hög mjukhet och följsamhet.

BESKRIVNING AV UPPFINNINGEN:

20 Problemet med att åstadkomma ett absorberande alster som tål mekaniska påfrestningar samtidigt som det uppvisar ett vätskegenomsläppligt ytskikt som är mjukt och behagligt att bära närmast mot huden men ändå uppvisar hög yttorrhet, har väsentligen undanröjts med föreliggande uppfinning.

25 Ett materiallaminat enligt uppfinningen för användning som ett vätskegenomsläppligt ytskikt på absorberande alster såsom exempelvis en dambinda, ett inkontinensskydd eller en blöja utmärks främst av att materiallaminatet i planutsträckningen uppvisar två i längdriktningen sig sträckande sidopartier som sträcker sig i tvärriktningen från varsin

30 längsgående sidokant ett stycke in mot materiallaminatets längsgående mittaxel, samt ett mellan sidopartierna i materiallaminatets planutsträckning beläget mittparti. Det första materialskiktet och det andra materialskiktet i

materiallaminatets mittparti är intermittert sammanbundna med ett första bindningsmönster och det första materialskiktet och det andra materialskiktet i materiallaminatets båda sidopartier är intermittert sammanbundna med ett andra bindningsmönster. Vidare är procentandelen bunden yta i förhållande till den totala ytan i de båda sidopartierna större än procentandelen bunden yta i förhållande till den totala ytan i mittpartiet.

Uppfinningen avser även ett absorberande alster som uppvisar väsentligen avlång form med en planutsträckning, en längdriktning, en tvärriktning, samt en tjockleksriktning och uppvisande en i längdriktningen sig sträckande mittaxel samt två motstående i längdriktningen sig sträckande längsgående sidokanter. Det absorberande alstret innefattar ett vätskegenomsläppligt ytskikt, ett vätsketätt ytskikt och en absorptionskropp innesluten mellan de båda ytskikten. Det absorberande alstret innefattar ett materiallaminat enligt den tidigare beskrivningen, varvid materiallaminatet i alstrets längsgående mittparti uppvisar det första bindningsmönstret och materiallaminatet i alstrets längsgående sidopartier uppvisar det andra bindningsmönstret. Vidare är procentandelen bunden yta i förhållande till den totala ytan i de båda sidopartierna större än procentandelen bunden yta i förhållande till den totala ytan i mittpartiet. Mittpartiet sträcker sig i alstrets längdriktning utmed hela alstrets längd och de två sidopartierna sträcker sig i alstrets längdriktning utmed hela alstrets längd.

Med ett ytmaterial enligt uppfinningen har det visat sig att risken för att de ingående skikten separerar från varandra är avsevärt mindre. Genom att risken för att skikten lossnar från varandra är mindre, medför det även att risken för läckage minskar. En annan fördel med uppfinningen är att användarens visuella intryck av alstret förbättras då materialskikten hålls samman vid alstrets längsgående sidokanter. Fördelen med att ytan närmast mot användaren i alstrets längsgående mittparti inte uppvisar lika stor andel bunden yta som de längsgående sidopartierna, är att ytskiktet blir mjukare och mer bekvämt att bära i anliggning mot huden. Ytterligare en fördel är att

risken för att mittpartiet tar upp vätska vid bindningsställena är avsevärt minskad.

5 För att erhålla de tidigare nämnda fördelarna med ett ytskikt innefattande ett materiallaminat enligt uppfinningen, uppvisar materiallaminatet enligt en föredragen utföringsform en andel bunden yta i förhållande till den totala ytan i mittpartiet som åtminstone är 0,5 % mindre än andelen bunden yta i förhållande till den totala ytan i sidopartierna.

10 Enligt en utföringsform är andelen bunden yta i sidopartierna åtminstone 3%, men företrädesvis mer än 5%.

15 Enligt en annan utföringsform är andelen bunden yta i förhållande till den totala ytan i mittpartiet mellan 3% och 6% och andelen bunden yta i förhållande till den totala ytan i sidopartierna är mellan 5% och 8%. Det har visat sig att denna utföringsform är fördelaktig eftersom materialskikten både i sidopartierna och i mittpartiet bör vara så väl förankrade till varandra att inte luft tränger in mellan skikten och försämrar vätskeöverföringen, men samtidigt får inte andelen bunden yta vara så stor så att ytskiktet tar upp
20 vätska invid bindningspunkterna i en sådan utsträckning att ytan efter en första vätning känns våt. Framförallt i mittpartiet är andelen bunden yta beroende av tjockleken och tätheten på de i materiallaminatet ingående materialskikten. För tunna och täta materialskikt, är andelen bunden yta företrädesvis större än för materialskikt som är lite bulkigare och tjockare.

25

Enligt en utföringsform är både det första materialskiktet och det andra materialskiktet relativt tunt. Företrädesvis uppvisar det första materialskiktet en ytvikt som är 27 g/m² eller mindre och det andra materialskiktet en ytvikt som är 35 g/m² eller mindre. Fördelen med en sådan utföringsform, är att
30 materialen närmast vid bindningsställena endast i mycket begränsad omfattning uppvisar en förtätad struktur jämfört med materialskiktets struktur utanför området närmast vid bindningsställena. Det medför att

bindningsställenas tendens att dra till sig vätska på grund av kapillärverkan är relativt begränsad.

Enligt en utföringsform uppvisar varje bindningsställe en minsta
5 utsträckningsriktning och en andra utsträckningsriktning som är vinkelrät mot den minsta utsträckningsriktningen varvid den minsta utsträckningen, åtminstone i det första bindningsmönstret, är mindre än 0,8 millimeter. Enligt en ännu mer föredragen utföringsform är den minsta utsträckningen, åtminstone i det första bindningsmönstret, 0,3 millimeter eller mindre. De
10 nämnda utföringsformerna är fördelaktiga eftersom det har visat sig att då bindningsställena överskrider en viss storlek, är risken större för att vätska tas upp i materiallaminatet i och omkring bindningsställena. För att åstadkomma en tillräcklig förankring mellan skikten, d v s undvika att luft finns mellan skikten och försämrar kontakten mellan dem, har det vidare visat
15 sig att det är mer fördelaktigt med ett större antal små bindningsytor än ett färre antal bindningsytor med en större bindningsyta.

Materiallaminatet föreligger med fördel i form av en sammanhängande, kontinuerlig bana varvid mittpartiet och sidopartierna sträcker sig kontinuerligt
20 i den kontinuerliga banans längdriktning. Ett sådant materiallaminat är förhållandevis enkelt och rationellt att tillverka i en löpande process och kan dessutom användas som ytmaterial på ett absorberande alster utan särskilda synkroniseringssvårigheter.

25 Enligt en föredragen utföringsform sträcker sig det första bindningsmönstret utmed hela alstrets längd, samt även det andra bindningsmönstret utmed hela alstrets båda sidopartiernas längd. I en sådan utföringsform är andelen bunden yta i mittpartiet densamma över hela alstrets längd, d v s den yta av
30 ytmateriallets mittparti som i alstrets planutsträckning är belägen närmast mot alstrets tvärgående ändkanter uppvisar även en mindre andel bunden yta än andelen bunden yta i de längsgående sidopartierna. Fördelen med en sådan

utföringsform, är att tillverkningen av ett absorberande alster med ett sådant ytmaterial är enklare på grund av att synkroniseringsproblemen minskar. Inpassning mot absorptionskroppen behöver enbart göras i absorptionskroppens längdriktning. Ytterligare en fördel är att det vid
5 sammanfogningen av materiallaminatet för användning som ytmaterial för absorberande alster, är möjligt att använda samma mönstervals till olika storlekar på det absorberande alstret.

Enligt en utföringsform är sidopartierna i alstrets tvärriktning 4 millimeter eller
10 bredare utmed hela alstrets längd. Vidare uppvisar mittpartiet i tvärriktningen samma bredd utmed hela mittpartiets längd. Eftersom alstrets grenparti i tvärriktningen är något smalare än alstrets båda ändpartier, medför det att sidopartierna är som smalast i grenpartiet och något bredare i alstrets ändpartier.

15

Enligt en utföringsform innefattar bindningsställena punktbindningar.

Enligt en annan utföringsform är det andra bindningsmönstret tätare än det första bindningsmönstret. Det innebär att avståndet mellan bindningsställena
20 i det andra bindningsmönstret är kortare än avståndet mellan bindningsställena i det första bindningsmönstret.

Enligt en utföringsform är både det första materialskiktet och det andra materialskiktet relativt tunt. Företrädesvis uppvisar det första materialskiktet
25 en ytvikt som är 27 g/m² eller mindre och det andra materialskiktet en ytvikt som är 35 g/ m² eller mindre. Fördelen med en sådan utföringsform, är att materialen närmast vid bindningsställena endast i mycket begränsad omfattning uppvisar en förtätad struktur jämfört med materialskiktets struktur utanför området närmast vid bindningsställena. Det medför att
30 bindningsställenas tendens att dra till sig vätska på grund av kapillärverkan är relativt begränsad.

KORT BESKRIVNING AV FIGURER:

Figur 1 visar en planvy av ett materiallaminat enligt uppfinningen med ett första bindningsmönster.

5

Figur 2 visar ett andra bindningsmönster.

Figur 3 visar en dambinda med ett materiallaminat enligt uppfinningen.

10 Figur 4 visar ett inkontinensskydd med ett materiallaminat enligt uppfinningen.

BESKRIVNING AV UTFÖRINGSFORMER:

15 Det i figur 1 visade materiallaminatet 1 innefattar ett första vätskegenomsläppligt fibröst materialskikt 2 och ett andra vätskegenomsläppligt poröst materialskikt 3. Åtminstone det första materialskiktet 2 men företrädesvis båda materialskikten 2,3 innefattar termoplastiskt material. Lämpliga termoplastiska material är polyolefiner såsom polyeten och
20 polypropen, samt polyamider, polyester och liknande. Även olika typer av bikomponentfibrer kan användas. De båda materialskikten 2,3 är inbördes förbundna genom att materiallaminatet 1 uppvisar bindningsställen där de båda materialskikten 2, 3 komprimerats och det termoplastiska materialet åtminstone delvis mjuknat och/eller smälts.

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Materiallaminatet 1 uppvisar en planutsträckning, en längdriktning, en tvärriktning, samt en tjockleksriktning. Materiallaminatet 1 uppvisar en i längdriktningen sig sträckande mittaxel samt två motstående i
längdriktningen sig sträckande längsgående sidokanter 9,10.

30 Materiallaminatets innefattar i dess tjockleksriktning ett första vätskegenomsläppligt fibröst materialskikt 2 och ett andra vätskegenomsläppligt poröst materialskikt. Från materiallaminatets

längsgående mittaxel ett stycke ut mot vardera längsgående sidokant sträcker sig ett mittparti 4. Mittpartiet 4 avgränsas av varsin längsgående mittlinje 11,12. Från mittpartiets 4 vardera mittlinje 11,12 mot materiallaminatets vardera längsgående sidokant 8,9, sträcker sig varsin sidoyta 5,6. Materialskikten 2,3 i materiallaminatets mittparti 4 är intermittert sammanbundet med ett första bindningsmönster 7 och materialskikten 2,3 i materiallaminatets sidoytor 5,6 är intermittert sammanbundna med ett andra bindningsmönster 8. Procentandelen bunden yta i förhållande till den totala ytan i de båda sidopartierna 5,6, är större än procentandelen bunden yta i förhållande till den totala ytan i mittpartiet 4.

Då materiallaminatet används som vätskegenomsläppligt ytmaterial på ett absorberande alster, är det första materialskiktet 2 det skikt på ett absorberande alster som är avsett att vara vänt mot en användare. Det är därför viktigt att det första skiktet 2 har en slät och mjuk yta. Det första materialskiktet 2 utgörs lämpligen av ett nonwovenmaterial. Nonwovenmaterial kan framställas med många olika metoder, exempelvis genom kardning eller spinning av ett fiberflor som därefter binds. Vidare kan s k meltblownteknik användas för att avsätta korta fibrer i form av en fibermatta. Det finns en rad olika sätt att binda fibrerna i ett nonwovenmaterial. Exempelvis kan olika typer av bindemedel användas. Vidare kan värmesmältbara komponenter i materialet utnyttjas för bindning med ultraljud, eller genom värmeförsel. Andra bindningsmetoder är nålning och hydroentangling. Olika bindningsmetoder kan dessutom kombineras med varandra.

Även det andra materialskiktet 3 kan utgöras av ett nonwovenmaterial. Då materiallaminatet skall användas som ett vätskegenomsläppligt ytskikt för en dambinda, är det andra materialskiktet 3 lämpligen ett nonwovenmaterial med en högre hydrofilitet än det första materialskiktet 2. Det andra materialskiktet 3 fungerar för ett sådant alster lämpligen som ett

vätskespridande skikt, vilket skikt även minskar återvätning från absorptionskärnan vid belastning.

5 Då materiallaminatet skall användas som ett vätskegenomsläppligt ytskikt för ett inkontinensskydd eller en barnblöja uppvisar företrädesvis det andra materialskiktet 3 en större tjocklek än det första materialskiktet 2 och utgörs av ett poröst och spänstigt fibermaterial. Det andra materialskiktet 3 fungerar som ett vätskeöverföringsskikt och bör ha förmåga att på kort tid ta emot stora mängder vätska, sprida vätskan i materialskiktets plan, föra vätskan
10 vidare till en under materiallaminatet anordnad absorptionskropp, samt dessutom tillfälligt kunna lagra vätska som inte hunnit absorberas av absorptionskroppen. Material som är särskilt lämpade för användning i det andra materialskiktet är syntetfibervaddar, kardade bundna eller obundna fiberskikt, eller relativt bulkiga nonwovenmaterial. Andra typer av lämpliga
15 material är porösa hydrofila skummaterial. Det är även möjligt att det andra materialskiktet består av två eller flera lager av olika eller samma typ av material.

De båda materialskikten 2,3 är inbördes förbundna med ett stort antal
20 bindningsställen 7,8. Bindningsställena har bildats genom samtidig komprimering och energitillförsel till materiallaminatet 1. Vid energitillförseln mjuknar eller smälter det termoplastiska materialet vid bindningsställena 7,8 och därigenom binds de båda materialskikten 2,3 samman. Sammanbindningen av det första och det andra materialskiktet 2,3 sker med
25 värmebindning såsom exempelvis ultraljudsbindning eller laserbindning. Vid avsvälning av det smälta eller mjuknade termoplastiska materialet i laminatet 1 stelnar det smälta och/eller mjuknade materialet.

Det i figur 2 visade materiallaminatet 200 uppvisar punktformiga
30 bindningsmönster. Materiallaminatet 200 uppvisar ett första bindningsmönster 207 i alstrets längsgående mittparti 204 och ett andra bindningsmönster 208 i alstrets längsgående sidopartier 205,206. I

mittpartiet 204 är de punktformiga bindningarna 204 i bindningsmönstret 207 på ett större avstånd från varandra än de punktformiga bindningarna i det andra bindningsmönstret 208 i de båda sidoytorna 205,206. Naturligtvis kan bindningsställena även utgöras av andra former än de som visats i figur 1 och 2. Då bindningsställena utgörs av linjeformiga bindningsytor, menas att bindningsställets minsta utsträckning är avsevärt mycket mindre än den vinkelrät mot den minsta utsträckningen sig sträckande andra utsträckningen. I begreppet linjeformiga bindningsställena innefattas även kurvformiga bindningsställena. Vidare kan det första bindningsmönstret och det andra bindningsmönstret uppvisa samma form eller alternativt uppvisa olika former. Då bindningsmönstren uppvisar samma form, är det glesare mellan varje bindningsställe i det första bindningsmönstret eller alternativt är det glesare mellan varje mönsterenhet i det första bindningsmönstret. Det är även möjligt att varje bindningsställe i det första bindningsmönstret upptar en mindre yta än varje bindningsställe i det andra bindningsmönstret. Det är även i materiallaminatets tvärriktning möjligt med bindningsmönster som närmast intill materiallaminatets längsgående sidokanter uppvisar en högsta andel bunden yta i förhållande till andelen obunden yta, varvid andelen bunden yta gradvis minskar mot materiallaminatets längsgående mittaxel.

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Den i figur 3 visade dambindan 300 innefattar ett första vätskegenomsläppligt ytskikt 301 i enlighet med uppfinningen, ett vätsketätt ytskikt 313, samt en mellan ytskikten innesluten absorptionskropp 315. Det vätsketäta ytskiktet 313 kan bestå av en vätsketät plastfilm, ett nonwovenskikt som är belagt med ett vätskespärrande material, eller något annat lättböjligt materialskikt som motstår vätskepenetration. Det är i allmänhet en fördel om det vätsketäta ytskiktet har viss andningsbarhet, d v s tillåter passage av vattenånga. De båda ytskikten 301,313 har något större utsträckning i planet än absorptionskroppen 315 och sträcker sig ett stycke ut förbi absorptionskroppens 315 kanter kring hela dennas periferi. Ytskikten 301,313 är inbördes förbundna inom de utskjutande partierna, exempelvis genom limning eller svetsning med värme eller ultraljud. Det är även möjligt

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att sammanbindningen inom de utskjutande partierna av ytskikten 301,313 sker samtidigt som sammanbindningen av det vätskegenomsläppliga ytskiktets första och andra materialskikt 302,303.

- 5 Absorptionskroppen 315 är vanligen uppbyggd av ett eller flera skikt av cellulosafibrer, exempelvis cellulosafloffmassa. Exempel på en för ändamålet lämplig absorberande struktur beskrivs i WO 94/10956, i vilken den absorberande strukturen skärs till från en materialbana utan föregående defibrering och mattbildning. Materialet ökar det färdiga absorberande
10 alstrets yttorrhet, vilket är en särskild fördel då det vätskegenomsläppliga ytskiktet 301 har ett textilt materiallager närmast användaren.

Absorptionskroppen 315 kan förutom cellulosafibrer även innehålla superabsorberande material, d v s material i form av fibrer, partiklar, granulat,
15 film eller liknande vilket har förmåga att absorbera vätska motsvarande flera gånger det superabsorberande materialets egen vikt. Det superabsorberande materialet binder den absorberande vätskan och bildar en vätskehaltig gel. Vidare kan absorptionskroppen 315 innefatta bindemedel, formstabiliserande komponenter eller liknande. Ytterligare absorptionsskikt som förbättrar
20 absorptionsegenskaperna kan även användas, såsom olika typer av vätskespridande inlägg eller materialskikt. Absorptionskroppen 315 kan behandlas kemiskt eller fysikaliskt för att ändra absorptionsegenskaperna. Det är exempelvis vanligt att förse ett absorptionsskikt med komprimeringar för att styra vätskeflödet i absorptionskroppen. Vidare kan andra typer av av
25 absorptionsmaterial utnyttjas, ensamma eller i kombination med cellulosafibrer och superabsorberande material. Exempel på användbara absorberande material är absorberande nonwovenmaterial, skum eller liknande.

- 30 På utsidan av det vätskespärrande ytskiktet 313 är ett fastsättningsorgan 317 i form av två områden av självhäftande lim. Limområdena 317 är lämpligen innan användning täckta med på ritningen ej visade löstagbara skyddsskikt

- av släppmedelbehandlat papper, eller plastfilm. En rad andra limmönster än de visade är naturligtvis tänkbara, liksom andra typer av fastsättningsorgan såsom kardborreytor, tryckknappar, gördlar, särskilda underbyxor eller liknande. En dambinda av det i figur 3 visade slaget fästs vid användningen inuti ett par vanliga underbyxor. Syftet med fastsättningsorganet är att hålla dambindan på plats i underbyxorna under användningen. Fastsättningsorganet bör naturligtvis vara av sådant slag att dambindan kan avlägsnas ur underbyxorna utan att dessa skadas.
- 10 Dambindan 300 uppvisar något bredare ändpartier 318,319 och ett något smalare grenparti 320 beläget mellan ändpartierna 318,319. Grenpartiet 320 är det parti av dambindan som är avsett att under användningen vara anbragt i användarens gren och tjäna som mottagningsyta för den kroppsvätska som avsöndras till dambindan.
- 15 Dambindan uppvisar vidare två tvärgående ändkanter 322,324, samt två längsgående sidokanter 326,328 löpande mellan ändkanterna 322,324. Dambindan 300 är vidare försedd med fastsättningsflikar 330,332 vilka är bildade av de båda ytskikten 301,313 och vilka skjuter ut från dambindans 300 sidokanter 326,328 vid grenpartiet 320. Fastsättningsflikarna 330,332 är avsedda att vid användning av dambindan 300 vara vikta kring benkanterna på användarens underbyxor och vara fästa mot utsidan av underbyxorna. För detta ändamål är fastsättningsflikarna 330,332 försedda med särskilda fastsättningsorgan 334 vilka kan väljas på samma sätt som fastsättningsorganet 317 på det vätskespärrande ytskiktet 313. Uppfinningen är naturligtvis även tillämpbar på dambindor som inte uppvisar några utskjutande fastsättningsflikar i grenpartiet, men en fördel med en sådan utföringsform är att det andra bindningsmönstret sträcker sig i alstrets tvärriktning utmed fastsättningsflikarnas hela längd, varvid bredden på det andra bindningsmönstret inte är mindre än i alstrets båda ändpartier.
- 20
- 25
- 30

Det vätskegenomsläppliga ytskiktet 301 består av ett första materialskikt 302 och ett andra materialskikt 303. Det första materiallagret 302 består av ett textilt material vilket vid användning av dambindan är avsett att anligga mot användarens kropp. Det textila materialet kan bestå av ett vävt eller stickat
5 tyg, men är företrädesvis ett nonwovenmaterial av spunbondtyp. Det första materialskiktet uppvisar vidare ett flertal genomgående hål 336. Det är givetvis även möjligt att det första materialskiktet 302 uppvisar hål av olika hålstorlekar. En fördel med att det första materialskiktet 302 uppvisar genomgående hål 336, är att materialskiktet kan utgöras av ett hydrofobt
10 nonwovenmaterial som inte sig är vätskegenomsläppligt. Ett sådant första materialskikt förblir även efter ett flertal vätningar förhållandevis torrt.

Exempelvis kan hålen göras med hjälp av varma nålar. Ett värmesmältbart material i det första materialskiktet 302 kan i samband med upptagandet av
15 hålen 336 i materiallagret smälta i området närmast intill varje hål 336. Då det smälta materialet åter stelnat efter hålgörningsprocessen, bildar det en i det närmaste vätsketät kant kring hela hålets periferi. Den sammanhängande kanten ökar höljesmaterialets dragstyrka och förhindrar att vätska sprids från hålen ut i ytskiktet 301. Istället passerar kroppsvätska som träffar dambindan
20 300 ner genom ytskiktet 301 till den innanför detta belägna absorptionskroppen 315.

Det vätskegenomsläppliga ytskiktets 301 andra materiallager 303 är anordnat innanför det första materiallagret 302. Det andra materiallagret 303
25 består företrädesvis av ett material som är mer hydrofilt än det första materiallagret 302, varigenom vätsketransport mellan de båda materiallagren 302,303 sker i riktning in mot dambindans absorptionskropp 315. Exempel på lämpliga material är olika typer av nonwovenmaterial, luftlagda eller våtlagda cellulosaskikt, vaddar av olika slag, skummaterial eller liknande.

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De båda i ytskiktet 301 ingående materiallagren 302,303 är inbördes förbundna på samma sätt som materialskikten 2,3 i det i figur 1 beskrivna

materiallaminatet 1. Således uppvisar ytskiktet 301 ett första bindningsmönster 307 i alstrets längsgående mittparti 304 och ett andra bindningsmönster 308 i alstrets längsgående sidopartier 305,306. Det första bindningsmönstret 307 utgörs av linjeformiga bindningsställena där fem eller
5 alternativt sex bindningsställena tillsammans bildar en stjärnformig enhet. Det första bindningsmönstret 307 utgörs således av en mångfald stjärnformiga enheter. Det andra bindningsmönstret 308 utgörs av en mångfald raka linjeformiga bindningsställena som sträcker sig i alstrets tvärriktning. Då bindningsställena utgörs av en väsentligen rak linje, är det en fördel om
10 bindningsställenas utsträckning i längdriktningen uppvisar en vinkel mot alstrets längdriktning. Således förhindras materialskikten i alstrets sidokanter på ett mer effektivt sätt från att separeras från varandra jämfört med om bindningsställenas utsträckning i längdriktningen sammanfaller med alstrets längdriktning.

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Det i figur 4 visade inkontinensskyddet 400 innefattar ett ytskikt 401 som är uppbyggt av ett materiallaminat som tidigare beskrivits i figur 1. Inkontinensskyddet 400 är i stort sett uppbyggt på samma vis som den i figur 3 visade dambindan. Det vätskegenomsläppliga ytskiktets 401 andra
20 materialskikt 403 är ett vätskegenomsläppligt vätskeöverföringsskikt. Det vätskegenomsläppliga ytskiktet 401 innesluter tillsammans med ett vätsketätt ytskikt 413 en absorptionskropp 415. De båda ytskikten 401,413 har något större utsträckning i planet än absorptionskroppen 415 och sträcker sig ett stycke utanför absorptionskroppens kanter. Ytskikten 401,413 är inbördes
25 förbundna inom de utskjutande partierna, exempelvis genom limning eller svetsning med värme eller ultraljud.

Som ett på intet sätt begränsande exempel på ett materiallaminat enligt uppfinningen kan nämnas ett sammansatt nonwovenmaterial enligt
30 uppfinningen bestående av ett första materialskikt 402 av ett nonwovenmaterial av syntetfibrer och ett andra materialskikt 403 av en vadd av syntetfibrer.

Absorptionskroppen 415 är uppbyggd på liknande vis som den för dambindan i figur 3 beskrivna absorptionskroppen 315. Absorptionskroppar för inkontinensskydd innehåller vanligtvis mer superabsorberande material
5 än absorptionskroppar för dambindor. De tunna absorptionskroppar som idag är vanliga i barnblöjor och inkontinensskydd består ofta av en komprimerad, blandad eller skiktad struktur av cellulosafloffmassa och superabsorberande material.

10 På samma vis som för den i figur 3 beskrivna dambindan 300 är ett fastsättningsorgan anordnat på utsidan av det vätskespärrande ytskiktet 413, exempelvis i form av två områden av självhäftande lim. Limområdena 417 är lämpligen innan användning täckta med på ritningen ej visade löstagbara skyddsskikt av släppmedelbehandlat papper, eller plastfilm. En rad andra
15 limmönster än de visade är naturligtvis tänkbara,

Inkontinensskyddet 400 uppvisar något bredare ändpartier 418,419 och ett något smalare grenparti 420 beläget mellan ändpartierna 418,419. Grenpartiet 420 är det parti av inkontinensskyddet som är avsett att under
20 användningen vara anbragt i användarens gren och tjäna som mottagningsyta för den kroppsvätska som avsöndras till inkontinensskyddet.

PATENTKRAV

1. Ett materiallaminat (1) för användning som ett vätskegenomsläppligt
5 ytskikt på absorberande alster såsom en dambinda, ett inkontinensskydd, en
blöja eller liknande med en planutsträckning, en längdriktning, en tvärriktning,
samt en tjockleksriktning och uppvisande en i längdriktningen sig sträckande
mittaxel samt två motstående i längdriktningen sig sträckande längsgående
10 sidokanter (9,10), och innefattande i dess tjockleksriktning ett första
vätskegenomsläppligt fibröst materialskikt (2) och ett andra
vätskegenomsläppligt poröst materialskikt (3) varvid åtminstone ett av
materialsikten innefattar termoplastiskt material varvid de båda
materialsikten är inbördes förbundna genom att materiallaminatet uppvisar
15 bindningsställen inom vilka det termoplastiska materialet bringats att
åtminstone delvis mjukna eller smälta och därigenom sammanbinda de båda
materialsikten k ä n n e t e c k n a t a v att materiallaminatet (1) i
planutsträckningen vidare uppvisar två i längdriktningen sig sträckande
sidopartier (5,6) som sträcker sig i tvärriktningen från varsin längsgående
20 sidokant (9,10) ett stycke in mot materiallaminatets (1) längsgående mittaxel,
samt ett mellan sidopartierna (5,6) i materiallaminatets (1) planutsträckning
beläget mittparti (4), varvid det första materialskiktet (2) och det andra
materialsikttet (3) i materiallaminatets mittparti (4) är intermittent
sammanbundna med ett första bindningsmönster (7) och att det första
25 materialskiktet (2) och det andra materialsikttet (3) i materiallaminatets båda
sidopartier (5,6) är intermittent sammanbundna med ett andra
bindningsmönster (8), varvid procentandelen bunden yta i förhållande till den
totala ytan i de båda sidopartierna (5,6) är större än procentandelen bunden
yta i förhållande till den totala ytan i mittpartiet (4).

2. Materiallaminat enligt krav 1, k ä n n e t e c k n a t a v att andelen bunden yta i förhållande till den totala ytan i mittpartiet åtminstone är 0,5%-enheter mindre än andelen bunden yta i förhållande till den totala ytan i sidopartierna.

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3. Materiallaminat enligt krav 1 eller 2, k ä n n e t e c k n a t a v att andelen bunden yta i förhållande till den totala ytan i mittpartiet är mellan 3% och 6% och att andelen bunden yta i förhållande till den totala ytan i sidopartierna är mellan 5% och 8%.

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4. Materiallaminat enligt något av krav 1-3, varvid vardera bindningsställe uppvisar en minsta utsträckning och en andra utsträckning där den minsta utsträckningen är vinkelrät mot den andra utsträckningen

15 k ä n n e t e c k n a t a v att åtminstone den minsta utsträckningen i det första bindningsmönstrets bindningsställena är mindre än 0,8 millimeter.

5. Materiallaminat enligt krav 4, k ä n n e t e c k n a t a v att den minsta utsträckningen i det första bindningsmönstret är 0,3 millimeter eller mindre.

20 6. Materiallaminat enligt något av föregående krav,
k ä n n e t e c k n a t a v att bindningsställena innefattar punktbindningar.

7. Materiallaminat enligt något av föregående krav,
25 k ä n n e t e c k n a t a v att det första materialskiktet är ett hydrofobt nonwovenmaterial.

8. Materiallaminat enligt något av föregående krav,
k ä n n e t e c k n a t a v att det andra bindningsmönstret är tätare än det första bindningsmönstret.

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9. Materiallaminat enligt något av föregående krav,

k ä n n e t e c k n a t a v att materiallaminatet föreligger i form av en sammanhängande, kontinuerlig bana och att mittpartiet (4) och sidopartierna (5,6) sträcker sig kontinuerligt i den kontinuerliga banans längdriktning.

- 5 10. Ett absorberande alster uppvisande väsentligen avlång form med en planutsträckning, en längdriktning, en tvärriktning, samt en tjockleksriktning och uppvisande en i längdriktningen sig sträckande mittaxel samt två motstående i längdriktningen sig sträckande längsgående sidokanter (408,409), och innefattande ett vätskegenomsläppligt ytskikt (401), ett
- 10 vätsketätt ytskikt (413) och en absorptionskropp (415) innesluten mellan de båda ytskikten (401,413), k ä n n e t e c k n a t a v att alstret i planutsträckningen uppvisar två i längdriktningen sig sträckande sidopartier (405,406) som sträcker sig i tvärriktningen från varsin längsgående sidokant (408,409) ett stycke in mot alstrets mittaxel, samt ett mellan sidopartierna
- 15 (405,406) i alstrets planutsträckning beläget mittparti (404) varvid det vätskegenomsläppliga ytskiktet (401) innefattar ett materiallaminat (1) enligt något av patentkrav 1-9, varvid materiallaminatet (1) i alstrets mittparti uppvisar det första bindningsmönstret och materiallaminatet i alstrets sidopartier uppvisar det andra bindningsmönstret.

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11. Absorberande alster enligt krav 10, k ä n n e t e c k n a t a v att sidopartiernas (405,406) längdutsträckning i alstrets tvärriktning utmed hela sidopartiets längd åtminstone är 4 millimeter.

SAMMANDRAG

Uppfinningen avser materiallaminat för användning som ytskikt på
5 absorberande alster såsom dambindor, inkontinensskydd, blöjor, byxblöjor
eller liknande. Materiallaminatet innefattar ett första vätskegenomsläppligt
fibröst materialskikt och ett andra vätskegenomsläppligt poröst materialskikt,
varvid åtminstone ett av de två materialskikten innefattar termoplastiskt
10 material varvid de två materialskikten är inbördes förbundna genom att
ytmateriallaminatet uppvisar bindningsställena inom vilka det termoplastiska
materialet bringats att åtminstone delvis mjukna eller smälta och därigenom
sammanbinda de båda materialskikten. Materiallaminatet uppvisar i
planutsträckningen två i längdriktningen sig sträckande sidopartier som
sträcker sig i tvärriktningen från varsin längsgående sidokant ett stycke in
15 mot materiallaminatets längsgående mittaxel, samt ett mellan sidopartierna i
materiallaminatets planutsträckning beläget mittparti, varvid det första
materialsiktet och det andra materialsiktet i materiallaminatets mittparti är
intermittent sammanbundna med ett första bindningsmönster och att det
första materialsiktet och det andra materialsiktet i materiallaminatets båda
20 sidopartier är intermittently sammanbundna med ett andra bindningsmönster,
varvid procentandelen bunden yta i förhållande till den totala ytan i de båda
sidopartierna är större än procentandelen bunden yta i förhållande till den
totala ytan i mittpartiet. Uppfinningen avser även ett absorberande alster
innefattande materiallaminatet.

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(Fig. 1)